UNITED STATES DISTRICT COURT
DISTRICT OF MINNESOTA

Cardiac Science, Inc.,
a Delaware Corporation,

Plaintiff,

v.

Koninklijke Philips Electronics N.V.,
a Netherlands corporation d/b/a
Royal Philips Electronics;
Philips Electronics North America
Corporation, a Delaware corporation; and
Philips Medical Systems North America
Company, a Delaware corporation,

Defendants;

and

Koninklijke Philips Electronics N.V.,
a Netherlands corporation; and
Philips Electronics North America
Corporation, a Delaware corporation,

Counter Claimants,

v.

Cardiac Science, Inc.,
a Delaware corporation,

Counter Defendant.

Civil No. 03-1064 (DWF/RLE)

MEMORANDUM
OPINION AND ORDER

Adam R. Wichman, Esq., Bruce E. Black, Esq., David K. Tellekson, Esq., Heather C. Wilde, Esq., James E. Hanft, Esq., and Robert L. Jacobson, Esq., Darby & Darby PC; and Dennis C. Bremer, Esq., and Matthew J. Goggin, Esq., Carlson Caspers Vandenburgh & Lindquist, counsel for Plaintiff and Counter Defendant.

Adam R. Steinert, Esq., Eugene L. Chang, Esq., Gary Serbin, Esq., John M. DiMatteo, Esq., Kimberly May Rosen, Esq., Spyros S. Loukakos, Esq., Steven H. Reisberg, Esq., Willkie Farr & Gallagher LLP; and Lawrence J. Field, Esq., David D. Axtell, Esq., Douglas R. Boettge, Esq., and Harold D. Field, Jr., Esq., Leonard Street and Deinard, PA, counsel for Defendant and Counter Claimant.

Introduction

The above-entitled matter came before the undersigned United States District Judge on February 7-8, 2006, on the issue of patent claim construction pursuant to *Markman v. Westview Instruments, Inc.*, 517 U.S. 370 (1996).

Background

This litigation involves numerous patents for automatic external defibrillators ("AEDs"), which are portable electronic devices that allow a person with no medical training to administer a defibrillation shock to a person who is in sudden cardiac arrest. Plaintiff Cardiac Science, Inc. ("Cardiac Science") asserts that defibrillator products made and sold by Defendants Koninklijke Philips Electronics, N.V., Philips Electronics North America Corporation, and Philips Medical Systems North America, Inc. (collectively, "Philips") infringe ten U.S. Patents owned by Cardiac Science, namely, U.S. Patent Nos. 5,402,884 (the "'884 Patent"); 5,579,919 (the "'919 Patent"); 5,645,571 (the "'571 Patent"); 5,700,281 (the "'281 Patent"); 5,797,969 (the "'969 Patent"); 5,984,102 (the "'102 Patent"); 6,088,616 (the "'616 Patent"); 5,897,576 (the "'576 Patent"); 6,029,085 (the "'085 Patent"); and 6,366,809 B1 (the "'809 Patent") (collectively, the "Cardiac Science Patents"). Cardiac Science further asserts a declaratory judgment action for invalidity and noninfringement of the following

U.S. Patents owned by Philips: U.S. Patent No. 6,016,059 (the "'059 Patent"); 5,879,374 (the "'374 Patent"); 5,800,460 (the "'460 Patent"); 6,047,212 (the "'212 Patent"); and 5,607,454 (the "'454 Patent"). Philips' Third Amended Answer with Amended Counterclaims (the "Answer") asserts noninfringement and invalidity of the Cardiac Science Patents. Philips also asserts unenforceability due to inequitable conduct of the '571 Patent, the '969 Patent, the '281 Patent, and the '616 Patent. Finally, the Answer contends that Cardiac Science has infringed the following U.S. Patents owned by Philips: the '059 Patent, the '374 Patent, the '460 Patent, the '212 Patent, the '454 Patent, and U.S. Patent Nos. 5,591,213 (the "'213 Patent"), 6,230,054 B1 (the "'054 Patent"), 5,773,961 (the "'961 Patent"), 5,899,926 (the "'926 Patent"), 5,904,707 (the "'707 Patent"), and 5,868,792 (the "'792 Patent"). In its Reply to Defendants' Third Amended Answer with Amended Counterclaims (the "Reply"), Cardiac Science asserts, among other affirmative defenses, that the following Philips patents are unenforceable due to inequitable conduct: the '213 Patent, the '059 Patent, the '374 Patent, the '460 Patent, the '212 Patent, the '454 Patent, the '961 Patent, and the '054 Patent.

Discussion

I. Claim Construction Principles

Patent claim construction, i.e., the interpretation of the patent claims that define the scope of the patent, is a matter of law for the court. *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 970-71 (Fed. Cir. 1995), *aff'd* 517 U.S. 370 (1999). Proper claim construction requires an examination of the intrinsic evidence of record, including the claims of the patent language, the specification, and the prosecution history.

Vitronics Corp. v. Conceptronic, Inc., 90 F.3d 1576, 1582 (Fed. Cir. 1996). The terms used in the patent are presumed to carry "the meaning that the term would have to a person of ordinary skill in the art at the time of the invention." *Phillips v. AWH Corp.*, 415 F.3d 1303, 1313 (Fed. Cir. 2005) (en banc) (citation omitted), *cert. denied*, --- S.Ct. ---, 2006 WL 386393 (U.S. Feb. 21, 2006). The specification is "the single best guide to the meaning of a disputed term." *Id*. at 1315. The specification may prescribe a special definition given to a claim term, or a disavowal of claim scope by the inventor. *Id*. at 1316. In such cases, the inventor's intention that is expressed in the specification is dispositive. *Id*. The court may use a dictionary or technical treatise to "assist in understanding the commonly understood meaning" of a term, so long as any meaning found in such sources does not contradict the definition that is found in the patent documents. *Id*. at 1322-23. In addition, the court may not import limitations from the specification into the claims. *Id*. at 1323.

The parties have asked the Court to construe a multitude of claim terms for the various patents. For the most part, the Court will address the claim terms in the order that the parties addressed them at the *Markman* hearing.

II. The Cardiac Science Patents

A. The '969 Patent

The '969 Patent, entitled "One Button Lid Activated Automatic External Defibrillator," was issued on August 25, 1998. ('969 Patent at 1.) Generally, the patent describes an AED that automatically performs periodic self-tests on the operational status

of the defibrillator. (*Id*. at c. 1, ll: 14-19.) The patent is a continuation of the application that issued as the '571 Patent. (*Id*. at c. 1, ll: 5-10.)

The disputed claim language of the '969 Patent reads as follows:

> 1. A one button method of applying a defibrillation shock to a patient using an automated external defibrillator (AED) having a case including an electrode compartment, a pair of electrodes stored within the electrode compartment, an openable lid covering the electrode compartment, a high voltage circuit, and an operator-actuated rescue switch, the method including the steps of:
>
> opening the lid covering the electrode compartment to expose the electrodes therein wherein the electrodes are electrically connected to the AED prior to the opening of the lid and wherein the step of opening the lid causes the AED to be powered ON;
>
> retrieving the electrodes stored in the compartment;
>
> applying the electrodes to the patient;
>
> pausing while the high voltage circuit charges; and
>
> actuating the operator-actuating rescue switch a single time to apply a defibrillation shock to the patient via the electrodes.
>
> . . .
>
> 5. An automated external defibrillator (AED) having a case and a lid and a pair of electrodes wherein the AED has a processor for performing initialization and self-checking functions including:
>
> a) monitoring a lid switch;
>
> b) powering ON the AED when the lid switch is activated;
>
> c) initiating a rescue mode when the lid switch is activated;
>
> d) initiating lid opened self-test when the lid switch is activated;
>
> e) initiating a place electrode prompt;
>
> f) monitoring the impedance of the electrodes;
>
> g) initiating a check electrode prompt if the impedance does not fall within a preselected range;
>
> h) beginning a first analyze sequence if the impedance falls within the preselected range;
>
> i) generating a high voltage charge when a shockable rhythm is detected;
>
> j) enabling an operator actuated button for release of a defibrillation shock; and
>
> k) initiating a push button to rescue prompt.

. . .

7. The defibrillator as in claim 5 wherein the lid open self-test of function (d) further includes the functions of:

checking the charge state of batteries of the AED;
checking the interconnection and operability of the electrodes;
checking the state of memory in the AED;
checking the functionality of a real time clock of the AED; and
checking the functionality of an analog to digital converter of the AED.

. . .

10. An automated external defibrillator (AED) having a case and a lid and a pair of electrodes wherein the AED has a processor for performing initialization and self-checking functions including:

a) monitoring a lid switch;
b) powering ON the AED when the lid switch is activated;
c) initiating a rescue mode when the lid switch is activated;
d) monitoring the impedance of the electrodes;
e) beginning a first analyze sequence if the impedance falls within the preselected range;
f) generating a high voltage charge when a shockable rhythm is detected; and
g) enabling an operator actuated button for release of a defibrillation shock.

. . .

12. The defibrillator of claim 10 wherein the lid open self-test of function (d) further includes the functions of:

checking the charge state of batteries of the AED;
checking the interconnection and operability of the electrodes;
checking the state of a memory in the AED;
checking the functionality of a real time clock of the AED; and
checking the functionality of an analog to digital converter of the AED.

. . .

15. An automated external defibrillator (AED) having a case and a lid and a pair of electrodes wherein the AED has a processor for performing initialization and self-checking functions including:

a) monitoring a lid switch;
b) powering ON the AED when the lid switch is activated;

> c) initiating a rescue mode when the lid switch is activated;
> d) beginning a first analyze sequence;
> e) generating a high voltage charge when a shockable rhythm is detected; and
> f) enabling an operator actuated button for release of a defibrillation shock.

('969 Patent, c: 8, ll: 31-48; c: 8, l: 58 – c. 9, l: 12; c: 9, ll: 34-50; c: 10, ll: 4-13; c: 10, ll: 18-31.)

1. "beginning a first analyze sequence"

Claims 5, 10, and 15 of the '969 Patent describe a function of the AED as "beginning a first analyze sequence." Cardiac Science contends that this phrase should be construed as "starting a sequence of analysis." Philips, on the other hand, asserts that this phrase should be construed as "starting to perform analysis for the first time only after a pre-selected impedance is detected."

The specification describes this function as follows:

> After detecting an impedance indicating the proper placement of electrodes 50, and without further action by the operator (i.e., automatically), processor 74 begins a first analyze sequence by initiating the generation of a "Do not touch patient. Analyzing rhythm." voice prompt, and analyzing the patient's cardiac rhythm.

('969 Patent at c. 5, ll: 53-58.) The specification proceeds to describe, in sequential order, the manner in which the invention performs all of the functions listed in the claim language. (*Id*. at c. 6, ll: 23-64.) The specification states that the "second series of analyze/charge/shock sequences is identical to the first series described above, except the energy content of the defibrillation pulse can be about two hundred joules or three hundred joules." (*Id*. at c. 6, ll: 26-29.)

Philips places significant emphasis on the word "first," and asserts that because there is no need to differentiate the first from the second analyze sequences, the term "first" must mean first in time. Cardiac Science, on the other hand, contends that Philips is attempting to import limitations into the claim term. Cardiac Science asserts that the numerical designators in the claims are merely terms used as placeholders to designate the separate analyze sequences that are claimed. Thus, Cardiac Science maintains that the term "first" does not mean the first in time, but rather the first of two or more analyze sequences.

The Court finds that, consistent with the claim language, the function of "beginning a first analyze sequence" does not occur until a preselected impedance is detected. (*Id*. at c. 9, ll: 6-7; c. 9, ll: 45-46.) The specification offers no other explanation of this function other than that the first analyze sequence begins after detecting whether the impedance indicates the proper placement of electrodes. (*Id*. at c. 5, ll: 53-58.) In addition, the sequence of analysis/charge/shock may be relevant. Although the specification states that each sequence is identical, the specification also describes sequential increases to the energy content of the defibrillation pulses. (*Id*. at c. 6, ll: 19-21, 29-30, 35-39.)

Consistent with the claim language and the specification, the Court construes the term "beginning a first analyze sequence" as "starting to perform analysis for the first time after a preselected impedance is detected."

2. "generating a high voltage charge when a shockable rhythm is detected"

Claims 5, 10, and 15 of the '969 Patent describe a function of the AED as "generating a high voltage charge when a shockable rhythm is detected." Philips asserts that this phrase should be construed as "starting to charge the high voltage capacitor at the time the device recognizes fibrillation." Cardiac Science contends that the term "generating" means "producing," but does not offer further construction for the phrase.

In support of its construction, Philips points to language from the specification, which states that "[w]hen a shockable rhythm is detected, processor 74 begins a first charge sequence by initiating the generation of a 'Charging.' voice prompt, and causes high voltage generation circuit 86 to operate in the charge mode." ('969 Patent at c. 6, ll: 7-10.) Cardiac Science, however, asserts that the specification distinguishes between generating the high voltage charge and charging the capacitors. Cardiac Science also asserts that dictionaries commonly define the term "generate" as "to produce," rather than "to start."[1]

The specification does not distinguish between the charge mode of the high voltage generation circuit and the charging of the capacitors. The high voltage generation circuit consists, in part, of the capacitors. As the patent specification explains:

> In response to charge controls provided by the processor 74, high voltage generation circuit 86 is operated in a charge mode during which one set of

[1] The parties appear to agree that an initial source of dispute, whether "generating" means "discharging," is no longer at issue, because Cardiac Science conceded at oral argument that it was not attempting to equate "generating" with "discharging." (Tr. at 60.)

> semiconductor switches (not separately shown) cause a plurality of capacitors (also not shown), to be charged in parallel to the 12 V potential supplied by power generation circuit 84.

('969 Patent at c. 4, ll: 3-9.) The device looks for a shockable rhythm, or fibrillation, and when that rhythm is detected, the device has to generate a very high voltage charge so that it can attempt to defibrillate the heart. As to this claim term, the word "generating" refers to the charging of the high voltage generation circuit, including the capacitors. (*Id*. at c. 6, ll: 7-10.) Thus, the Court finds that the term "generating a high voltage charge when a shockable rhythm is detected" should be construed as "initiating a charge in the high voltage generation circuit at the time that the device detects a shockable rhythm (or recognizes fibrillation)."

3. "electrode compartment"

Claim 1 of the '969 Patent describes an "electrode compartment." Philips asserts that this term should be defined as "a part of an enclosed space within the defibrillator case to hold the electrodes." Cardiac Science contends that the term "compartment" is commonly understood and need not be construed. Alternatively, Cardiac Science asserts that the term should be construed as "a defined space for containing electrodes."

The heart of the parties' dispute is whether the space of the compartment needs to be completely enclosed or not. Philips asserts that the defibrillator case lid 28 encloses the electrode compartment in the '969 Patent. ('969 Patent at c. 2, ll: 26-33.) However, Cardiac Science maintains that the space need not be enclosed. Specifically, Cardiac Science asserts that the electrode compartment is still referred to as a compartment even when the lid is open, thus demonstrating that Philips' construction is inappropriate. (*Id*.

at c. 2, ll: 26-29.) The dictionary definition could support either party's construction. Merriam-Webster's defines "compartment" both as "a separate division or section" and "one of the parts into which an enclosed space is divided." Merriam-Webster's Collegiate Dictionary 252 (11th ed. 2003).

The Court finds that Philips' proposed construction is misguided. The "enclosed space" to which Philips refers, if anything, is that of the defibrillator case. Even following the dictionary definition of "compartment" that Philips advances, the electrode compartment would merely be a division of an enclosed space, that enclosed space being the defibrillator case. But the compartment itself need not be enclosed, as Cardiac Science is correct in asserting that the electrode compartment still remains a "compartment" even when the lid is open.

With these considerations in mind, the Court construes the term "electrode compartment" to mean "a section within the defibrillator case that contains the electrodes."

4. "real-time clock"

Claims 7 and 12 of the '969 Patent describe a "real-time clock." Philips asserts that this term should be construed as "a device that keeps track of the actual date and time, and not just elapsed time." Cardiac Science, on the other hand, contends that the term should be defined as "a component that keeps track of time."

In support of its construction, Philips points to the specification, which states that upon completion of the periodic self-tests, the processor causes a record of the self-test to be stored in memory. ('969 Patent at c. 8, ll: 6-8.) The specification further states that

"[e]ach stored record includes data representative of the date and time of the test and the results of the test." (*Id*. at c. 8, ll: 8-10.) The specification also references stored memory data in the form of the "real time" or "actual time" that certain events occurred related to the use and testing of the defibrillator unit. (*Id*. at c. 7, ll: 56-67.)

Consistent with the specification, the Court construes "real time clock" to mean "a clock that keeps track of the actual date and time."

5. "powered on"

Claim 1 of the '969 Patent describes the method of Claim 1 "wherein the step of opening the lid causes the AED to be powered ON." Philips contends that the term "powered ON" should be construed as "the AED is turned from off to on." Cardiac Science asserts that "on means on" and the phrase needs no further construction.

In support of its construction, Cardiac Science asserts that the patent describes a standby mode or quiescent state during which periodic and automatic self-tests of the AED components occur on a daily or weekly basis. ('969 Patent at c. 7, ll: 24-56.) Cardiac Science contends that these self-tests require electronics and power. Thus, Cardiac Science asserts that the AED is neither "on" nor "off" but rather in the standby mode. Then, when the AED is needed for a rescue, the user opens the lid of the AED and the AED is turned from the standby mode to "ON." Philips, on the other hand, asserts that the specification of the '969 Patent does not describe such a "standby" state. Instead, Philips contends that the patent describes the lid as an on/off switch. (*Id*. at c. 4, ll: 57-58; c. 8, ll: 19-22.) Thus, Philips maintains that opening the lid controls whether the AED is powered on or powered off.

The Court finds that although the word "standby" never appears in the '969 Patent, the specification describes a dormant state of the invention whereby the device performs various self-tests without actually being "powered on." If the Court were to agree with Philips' construction that the device is powered "off" until the lid is opened, it would imply that there is no functionality or power to the unit, and this is plainly not the case. For this reason, the Court agrees with Cardiac Science that opening the lid does not switch the device from "off" to "on." Thus, the Court construes the term "on" to mean "on."

B. The '571 Patent

The '571 Patent, entitled "Automated External Defibrillator with Lid Activated Self-Test System," was issued on August 8, 1995. ('571 Patent at 1.) Generally, the '571 Patent describes an automated external defibrillator that automatically performs self-tests on the defibrillator electrodes, battery charge state, and high voltage circuit operation on a daily and weekly basis. (*Id*. at 1.) The '571 Patent is a continuation-in-part of an assigned application, Ser. No. 08/509,990, filed August 1, 1995. (*Id*. at c. 1, ll: 6-9.)

The disputed claim language of the '571 Patent reads as follows:

> 1. An automated external defibrillator, comprising:
> a case;
> a pair of defibrillator electrodes electrically connected to one another within a package and including lead wires with connectors extending from the package being removably disposed within the case;
> electrode terminals being disposed within the case and configured for electrical interconnection to the lead wire connectors of the defibrillator electrodes;
> a battery compartment and battery terminals in the case, the battery compartment and terminals configured for holding and interconnecting to one or more batteries;

a high voltage circuit being disposed within the case and coupled to the battery terminals and the electrode terminals, for generating defibrillation pulses and applying the pulses to the electrode terminals;

a maintenance indicator on the case; and

a digital control system being disposed within the case and coupled to the electrode terminals, battery terminals, high voltage circuit and maintenance indicator, and including self test means for periodically and automatically performing a self-test of the functionality of one or more defibrillator components, and for actuating the maintenance indicator if a malfunctioning component is identified wherein the self-test means includes means for checking the defibrillator electrodes by providing selected communications through a circuit formed in part of the lead wires and the electrically connected pair of electrodes.

. . .

3. An automated external defibrillator configured for use with a packaged pair of electrodes electrically connected to one another within the package and including lead wires with connectors extending from the package, the defibrillator including:

a case;

electrode terminals being disposed within the case and configured for electrical interconnection to defibrillator electrode connectors;

a battery compartment and batter terminals in the case, the battery compartment and terminals configured for holding and interconnecting to one or more batteries;

a high voltage circuit being disposed within the case and coupled to the battery terminals and the electrode terminals, for generating defibrillation pulses and applying the pulses to the electrode terminals;

an impedance measuring circuit being disposed within the case for measuring the impedance between the electrode terminals;

a battery level monitoring circuit being disposed within the case for measuring the charge state of the batteries;

indicator on the case; and

a digital control system being disposed within the case and coupled to the electrode terminals, battery terminals, high voltage circuit, impedance measuring circuit, battery level monitoring circuit and maintenance indicator, including:

self test initiating means for periodically and automatically initiating defibrillator self-tests;

battery test means for checking the charge state of the batteries during self-tests, and for actuating the maintenance indicator when low battery charge states are identified;

electrode connection test means for checking the electrical interconnection of electrodes to the electrode terminals as a function of the measured impedance between the electrode terminals during self-tests, and for actuating the maintenance indicator when disconnected electrode states are identified;

electronic memory; and

memory test means for checking the functionality of the electronic memory during self-test, and for actuating the maintenance indicator when memory faults are identified.

4. An automated external defibrillator, having a case and having defibrillator components, including a packaged pair of defibrillator electrodes electrically connected to one another within the package and including lead wires with connectors extending from the package, at least two electrode terminals configured for electrical interconnection to the defibrillator electrodes, at least one self contained power supply disposed within the case, a high voltage circuit electrically coupled to the at least one self-contained power supply and to the defibrillator electrode terminals, the high voltage circuit for generating defibrillation pulses and applying the pulses to the electrode terminals, and a digital control system coupled to the electrode terminals, the at least one self-contained power supply, and the high voltage circuit, and including self-test means controlled by the digital control system for periodically and automatically performing a self-test of one or more defibrillator components, and for providing a maintenance indication if a malfunctioning component is identified, the digital control system further controlling a rescue mode of operation, the rescue mode of operation including at least the steps of coupling the high voltage circuit to the battery terminals and the defibrillator electrode terminals, generating the defibrillation pulses, and applying the pulses to the defibrillator electrode terminals, comprising:

a voice circuit operably coupled to the digital control system, and

a speaker operably coupled to the voice circuit,

whereby the digital control system provides commands to the voice circuit, and responsive thereto, the voice circuit generates audible voice prompts emitted by the speaker.

5. An automated external defibrillator, having a case and having defibrillator components, including at least electrode terminals configured for electrical interconnection to defibrillator electrodes, at least one self-contained power supply disposed within the case, a high voltage circuit electrically coupled to the at least one self-contained power supply and to the electrode terminals, the high voltage circuit for generating defibrillation

pulses and applying the pulses to the electrode terminals, and a digital control system coupled to the electrode terminals, the at least one self-contained power supply, and the high voltage circuit, and including self-test means controlled by the digital control system for periodically and automatically performing a self-test of one or more defibrillator components, and for providing a maintenance indication if a malfunctioning component is identified, the digital control system further controlling a rescue mode of operation, the rescue mode of operation including at least the steps of coupling the high voltage circuit to the battery terminals and the electrode terminals, generating the defibrillation pulses, and applying the pulses to the electrode terminals, comprising:

a real time clock being operably communicatively coupled to the digital control system, the real time clock providing communication to the digital control system enabling the digital control system to maintain track of the steps of the rescue mode of operation.

. . .

7. An automated external defibrillator, having a case and having defibrillator components, including at least electrode terminals configured for electrical interconnection to defibrillator electrodes, at least one self-contained power supply disposed within the case, a high voltage circuit electrically coupled to the at least one self-contained power supply and to the electrode terminals, the high voltage circuit for generating defibrillation pulses and applying the pulses to the electrode terminals, and a digital control system coupled to the electrode terminals, the at least one self-contained power supply, and the high voltage circuit, and including self-test means controlled by the digital control system for periodically and automatically performing a self-test of one or more defibrillator components, and for providing a maintenance indication if a malfunctioning component is identified, the digital control system further controlling a rescue mode of operation, the rescue mode of operation including at least the steps of coupling the high voltage circuit to the battery terminals and the electrode terminals, generating the defibrillation pulses, and applying the pulses to the electrode terminals, comprising:

a real time clock being operably coupled to the digital control system, the real time clock providing a real time basis for storing data related to the time of placement of the defibrillator electrodes on the patient, the initiation of a cardiac rhythm analysis voice prompt, the patient's cardiac rhythm, the initiation of a charging voice prompt, the completion of a charge mode of operation of the high voltage circuit, and the initiation of a charge to the defibrillator electrodes.

. . .

10. An automated external defibrillator configured for use with a packaged pair of electrodes electrically connected to one another within the package and including lead wires with connectors extending from the package, the defibrillator including:

a case;

electrode terminals being disposed within the case and configured for electrical interconnection to defibrillator electrode connectors;

a battery compartment and battery terminals in the case, the battery compartment and terminals configured for holding and interconnecting to one or more batteries;

a high voltage circuit being disposed within the case and coupled to the battery terminals and the electrode terminals, for generating defibrillation pulses and applying the pulses to the electrode terminals;

an impedance measuring circuit being disposed within the case for measuring the impedance between the electrode terminals by providing selected communications through a circuit formed in part of the lead wires and the electrically connected pair of electrodes;

a battery level monitoring circuit being disposed within the case for measuring the charge state of the batteries;

indicator on the case; and

a digital control system being disposed within the case and coupled to the electrode terminals, battery terminals, high voltage circuit, impedance measuring circuit, battery level monitoring circuit and maintenance indicator, including:

self-test initiating means for periodically and automatically initiating defibrillator self-tests;

battery test means for checking the charge state of the batteries during self-tests, and for actuating the maintenance indicator when low battery charge states are identified;

electrode connection test means for checking the electrical interconnection of electrodes to the electrode terminals as a function of the measured impedance between the electrode terminals during self-tests, and for actuating the maintenance indicator when disconnected electrode states are identified.

. . .

20. An automated external defibrillator, having a case and having defibrillator components, including at least electrode terminals configured for electrical interconnection to defibrillator electrodes, at least one

> self-contained power supply disposed within the case, a high voltage circuit electrically coupled to the at least one self-contained power supply and to the electrode terminals, the high voltage circuit for generating defibrillation pulses and applying the pulses to the electrode terminals, and a digital control system coupled to the electrode terminals, the at least one self-contained power supply, and the high voltage circuit, and including self-test means controlled by the digital control system for periodically and automatically performing a self-test of one or more defibrillator components, and for providing a maintenance indication if a malfunctioning component is identified, comprising:
>
> the case having an openable and closeable lid, including means for activating the self-test means when opening or closing said lid.
>
> . . .
>
> 23. The defibrillator of claim 22 wherein the switch comprises a magnetic reed relay switch.

('571 Patent at c. 8, ll: 32-61; c: 9, l: 49 – c. 11, l: 16; c: 11, l: 45 – c. 12, l: 7; c: 12, l: 46 – c.13, l: 20; c: 14, ll: 10-29, 44-45.)

1. "battery compartment"

Claims 1, 3, and 10 of the '571 Patent describe a "battery compartment." Philips asserts that this term should be construed as "a part of an enclosed space within the defibrillator case to hold the battery." Cardiac Science contends that this term should be construed as "a defined space for containing batteries."

Similar to its arguments regarding the electrode compartment of the '969 Patent discussed above, Philips asserts that the battery compartment needs to be enclosed. Cardiac Science notes that the unenclosed nature of the battery compartment is demonstrated by the fact that the battery compartment still remains a compartment even when the AED lid is open.

The specification states that "[e]lectrical power is provided by a rechargeable twelve volt lead-acid cartridge battery 80 and a nine volt battery 82 which are removeably positioned within the battery compartment and connected to power generation circuit 84." ('571 Patent at c.3, ll: 13-16.) Cardiac Science is correct in asserting that neither the claim language nor the specification requires the battery compartment to be enclosed. Consistent with the Court's construction of the term "electrode compartment" discussed above, the Court construes "battery compartment" as "a section within the defibrillator case that contains the battery or batteries."

2. "self-contained power supply"

Claims 4, 5, 7, and 20 of the '571 Patent describe a "self-contained power supply." Philips contends that this term should be construed as "circuitry contained within a separate housing, that converts power from a power source (e.g., AC power) to another form (e.g., DC power)." Cardiac Science asserts that the phrase should be defined as "a power supply that is complete within itself."

In support of its construction, Cardiac Science asserts that the self-contained power supply of the '571 Patent is analogous to the batteries described in Claim 1, yet embraces a broader concept than just a battery. Cardiac Science maintains that the self-contained power supply is contained within itself, where all the power comes from a single place or a single package. Cardiac Science's construction is consistent with dictionary definitions of the term "self-contained." Merriam-Webster's Collegiate Dictionary, *supra*, at 1127. Philips, on the other hand, asserts that the '571 Patent clearly distinguishes between a battery and a power supply. Philips asserts that the claim

construction should reflect this difference. Moreover, Philips contends that technical dictionary definitions, and thus people of ordinary skill in the art, define a power supply as something that converts power from one form to another.

Column 3 of the '571 Patent describes the electrical system of the invention. The specification states that "[d]uring normal operation, power generation circuit 84 generates regulated "5 V, 3.3 V and 12 V (actually about 13.3 V) supplies with the power provided by the twelve volt battery 80." ('571 Patent at c. 3, ll: 16-19.) The specification continues to describe how each of these voltage supplies is used to power certain things in the AED. However, the patent does not describe an AC to DC conversion of power — the patent merely describes a power supply with a battery that provides DC power. Philips' proposed construction goes too far in this regard, and would read out a battery, which only provides DC power, as a possible self-contained power supply. In addition, the patent does not describe a power supply that is "contained within a separate housing," as Phillips proposes. Rather, the patent describes a self-contained power supply that is "disposed within the case" of the AED.

The Court finds that, based on the claim language and the patent specification, a straightforward definition of "self-contained power supply" is appropriate. Thus, the Court construes "self-contained power supply" to be "a power supply that is complete in itself."

3. "battery test means"

Claims 3 and 10 of the '571 Patent describe "battery test means for checking the charge state of the batteries during self-tests, and for actuating the maintenance indicator

when low battery charge states are identified." The parties agree that the phrase is in a means-plus-function format and thus subject to 35 U.S.C. § 112, ¶ 6, which "allows a patentee to recite a function to be performed as a claim limitation rather than reciting structure or materials for performing that function." *Omega Eng'g, Inc. v. Raytek Corp.*, 334 F.3d 1314, 1321 (Fed. Cir. 2003). The court's construction of a means-plus-function limitation follows a two-step approach. *Id*. First, the court must identify the claimed function, "staying true to the claim language and the limitations expressly recited by the claims." *Id*. (citations omitted). Once these functions are identified, the court must ascertain the corresponding structures in the written description that perform those functions. *Id*. "A disclosed structure is corresponding 'only if the specification or the prosecution history clearly links or associates that structure to the function recited in the claim.'" *Id*. (quoting *B. Braun Med., Inc. v. Abbott Labs.*, 124 F.3d 1419, 1424 (Fed. Cir. 1997)). The structure must be necessary to perform the recited function. *Id*. (citations omitted).

The parties agree that the function of the battery test means is checking the charge state of the batteries during self-tests and actuating the maintenance indicator when low battery charge states are identified. The parties also agree that "checking the charge state of the batteries" means "determining the charge state of the batteries." However, the parties dispute what corresponding structure is necessary to perform these two functions. Philips asserts that power generation circuit 84 and processor 74 are the structures necessary to perform these functions. Cardiac Science, on the other hand, contends that the processor is the only structure necessary to perform these functions.

As to the battery-checking function, the specification states that "[d]uring the lid opened self-test, processor 74 checks: 1) the charge state of batteries 80 and 82." (*Id*. at c. 5, ll: 3-4.) The specification also states that "[d]uring the lid closed self-test processor 74 performs a comprehensive check of the status and functionality of defibrillator 10, including: . . . 5) the charge state of batteries 80 and 82 . . . ." (*Id*. at c. 6, l: 67-c.7, l: 6.) The specification further reads: "The charge states of batteries 80 and 82 are checked by monitoring the voltage level signals provided by power generation circuit 84." (*Id*. at c. 5, ll: 7-9.) Finally, the specification states:

> [P]ower generation circuit 84 includes voltage level sensing circuits which are coupled to processor [sic] The voltage level sensing circuits provide low battery level signals to processor 74 whenever the voltage levels of batteries 80 or 82 are less than predetermined values such as 12.3 V and 8 V, respectively.

(*Id*. at c. 3, ll: 25-30.)

Philips asserts that the voltage level sensing circuits, which are part of power generation circuit 84, are coupled to the processor. Philips argues that these voltage level sensing circuits provide low-battery level signals to the processor when the voltage levels of batteries 80 and 82 are less than a predetermined value. Philips contends that without the voltage level sensing circuits, the processor has no means of ascertaining the voltage level of the batteries. Thus, Philips asserts that the power generation circuit 84 and the processor 74 are both necessary to check the charge state of the batteries during self-tests. Cardiac Science, on the other hand, asserts that it is only the processor that checks the charge state, based on the voltage that it determines from the batteries and the power generation circuit.

As to the actuating function, the specification states that "[l]ight 38 on diagnostic display panel 36 is illuminated (when lid 20 is subsequently opened), and maintenance indicator 20 is switched to its maintenance required state by processor 74 if faults are identified during the lid closed self-test." (*Id*. at c. 7, ll: 16-18.) Further, the specification reads: "If batteries 80 and/or 82 are determined to have a low charge, lights 44 and/or 42, respectively, on diagnostic display panel 36 are illuminated by processor 74." (*Id*. at c. 5, ll: 9-12.)

Cardiac Science contends that only the processor 74 is necessary to perform the actuating function. Philips, however, asserts that the processor alone lacks the ability to cause the mechanical movement of the maintenance indicator. Thus, Philips asserts that, in addition to the processor, the power generation circuit is a necessary structure to perform the actuating function.

The Court finds that the power generation circuit is necessary to perform the checking function, but not the actuating function. Without the voltage sensing circuits, which are part of the power generation circuit, the processor alone cannot check the batteries. The processor alone controls the maintenance indicator. The power generation circuit merely provides the power to activate the maintenance indicator, but its role is relatively trivial. Thus, the Court finds that the processor and the power generation circuit are the structures set forth in the patent that perform the function of checking the batteries. The processor performs the function of actuating the maintenance indicator.

4. "electrode connection test means"

Claims 3 and 10 of the '571 Patent disclose an "electrode connection test means for checking the electrical interconnection of electrodes to the electrode terminals as a function of the measured impedance between the electrode terminals during self-tests, and for actuating the maintenance indicator when disconnected electrode states are identified." The parties agree that this term is in a means-plus-function format and thus invokes 35 U.S.C. § 112, ¶ 6. It is also undisputed that the two performed functions of the electrode connection test means are: (1) checking the electrical interconnection of electrodes to the electrode terminals as a function of the measured impedance between the electrode terminals during self-tests; and (2) actuating the maintenance indicator when disconnected electrode states are identified. However, the parties dispute what structure is necessary to perform the recited functions. Philips argues that the corresponding structure includes processor 74, impedance measuring circuit 100, real-time clock 79, and the analog-to-digital converter 102. Cardiac Science asserts that the processor is the only structure necessary to perform the recited functions.

As to the checking function, the specification provides that "[d]uring the lid opened self-test, processor 74 checks: . . . 2) the interconnection and operability of electrodes 50 . . . ." ('571 Patent at c. 5, ll: 3-5.) Further, the specification provides: "The interconnection and operability of the electrodes 50 is [sic] checked by monitoring the impedance signals provided by impedance measuring circuit 100." (*Id*. at c. 5, ll: 12-15.)

As to the actuating function, the patent provides: "If the package 60 of electrodes 50 is missing or unplugged from connector 32, or if the electrodes are damaged (e.g., dried out), processor 74 will illuminate the indicator light 40 on diagnostic display panel 36." (*Id*. at c.5, ll: 15-18.)

In support of its construction, Philips points to the following language from the specification:

> Impedance measuring circuit 100 is connected to electrode connector 32 and real time clock 79, and is interfaced to processor 74 through analog-to-digital (A/D) converter 102. The impedance measuring circuit 100 receives a clock signal having a predetermined magnitude from clock 79, and applies the signal to electrodes 50 through connector 32. The magnitude of the clock signal received back from the electrodes 50 through connector 32 is monitored by impedance measuring circuit 100. An impedance signal representative of the impedance present across electrode connector 32 is then generated by circuit 100 as a function of the ratio of the magnitudes of the applied and received clock signals (i.e., the attenuation of the applied signal).

(*Id*. at c. 4, ll: 20-33.) Based on this specification language, Philips contends that the impedance measuring circuit, the clock, and the A/D converter all communicate with the processor in order to perform the functions of checking the interconnection of the electrodes to the electrode terminals and actuating the maintenance indicator.

The Court agrees with Philips' construction, in part. The Court finds that the processor requires the impedance signals provided by the impedance measuring circuit and the A/D converter to perform the functions of checking the interconnection of electrodes to the electrode terminals and actuating the maintenance indicator. However, the electrode connection checking and activation of the maintenance indicator functions do not necessarily rely on a clock to provide the voltage source. Thus, the Court finds

that the structures necessary to perform these functions include the processor, the impedance measuring circuit, and the A/D converter.

5. "self-test means"

Claim 1 of the '571 Patent discloses "self-test means for periodically and automatically performing a self-test of the functionality of one or more defibrillator components, and for actuating the maintenance indicator if a malfunctioning component is identified." Similarly, Claims 4, 5, 7, and 20 disclose "self-test means . . . for periodically and automatically performing a self-test of one or more defibrillator components, and for providing a maintenance indication if a malfunctioning component is identified." The parties agree that these limitations are in means-plus-function format, thereby invoking 35 U.S.C. § 112, ¶ 6. The functions claimed are also undisputed and identified as periodically and automatically performing a self-test of the functionality of one or more defibrillator components for Claims 1, 4, 5, 7, and 20. For Claim 1, the parties do not dispute that the second claimed function is actuating the maintenance indicator if a malfunctioning component is identified. And as to Claims 4, 5, 7, and 20, the parties agree that the second claimed function is identified as providing a maintenance indication if a malfunctioning component is identified. However, the parties dispute what structure is necessary to perform these recited functions.

As to Claim 1, Cardiac Science asserts that a processor is the only structure necessary to perform the recited functions. Philips, on the other hand, asserts that different structures are necessary to perform each of the recited functions. Philips contends that the structures for periodically and automatically performing various

self-tests should be construed as follows: (1) for electrode self-tests: the impedance measuring circuit 100, real time clock 79, analog to digital converter 102, and processor 74; (2) for battery self-tests: the power generation circuit 84 and processor 74; (3) for the memory self-test: processor 74; (4) for the real time clock self-test: processor 74 and real time clock 79; (5) for the analog to digital converter self-test: processor 74 and analog to digital converter 102; (6) for the high voltage discharge self-test: processor 74, high voltage generation circuit 86, and internal load 98; and (7) for the watchdog timer self-test: watchdog timer 92, power control circuit 88, and processor 74.

As to Claims 4, 5, 7, and 20, Cardiac Science contends that the processor and a maintenance indicator (or an alarm) are the only structures necessary to perform the two recited functions. Philips asserts that, as to the function of periodically and automatically performing self-tests, each self-test requires a different structure, as follows: (1) the electrode self-test requires the structures of impedance measuring circuit 100, real time clock 79, analog to digital converter 102, and processor 74; (2) the battery self-test requires the structures of power generation circuit 84 and processor 74; (3) the memory self-test requires the structure of processor 74; (4) the real time clock self-test requires the structure of processor 74 and real time clock 79; (5) the analog to digital converter self-test requires the structures of processor 74 and analog to digital converter 102; (6) the high voltage discharge self-test requires the structures of processor 74, high voltage generation circuit 86, and internal load 98; and (7) the watchdog timer self-test requires the structures of watchdog timer 92, power control circuit 88, and processor 74. Philips

asserts that the processor 74 and maintenance indicator 20 perform the function of providing a maintenance indication if a malfunctioning component is identified.

As to both functions, the patent specification provides that "[a] daily self-test is initiated and performed by processor 74 at a predetermined time each day (i.e., every twenty-four hours)." ('571 Patent, c. 7, ll: 24-26.) Further, the specification provides, "Processor 74 also initiates and performs a weekly self-test at a predetermined time one day each week. During the weekly self-test processor 74 performs all the component check operations described above that are performed during the daily self-test." (*Id*., c. 7, ll: 33-37.) Thus, the parties agree that, at a minimum, the processor is a necessary structure to perform both functions of the self-test means for all of the claims that include this term.

Cardiac Science asserts that the processor is the only structure that is required to perform the functions of periodically and automatically performing a self-test and actuating the maintenance indicator, as set forth in Claim 1. Cardiac Science contends that in addition to the processor, an additional structure is necessary to perform the functions of Claims 4, 5, 7, and 20; namely, either a maintenance indicator or an alarm. In support of its construction, Cardiac Science points to the following language from the specification: "processor 74 switches maintenance indicator 20 to its maintenance required state and activates alarm 96 if faults are identified during the daily self-test." (*Id*. at c. 7, ll: 30-32.)

The Court finds that the self-test means merely call into function the other self-tests that are performed by the invention and claimed in the patent. The Court finds

that the structure required for performing the self-test means includes a processor and a clock for measuring the time at which to perform the self-test.

6. "means for checking the defibrillator electrodes"

Claim 1 of the '571 Patent discloses self-test means that include "means for checking the defibrillator electrodes." The parties agree that this is a means-plus-function limitation that invokes 35 U.S.C. § 112, ¶ 6. Further, the parties agree that the recited function is checking the defibrillator electrodes. However, the parties dispute the corresponding structure that performs this function. Cardiac Science asserts that the impedance measuring circuit is the only structure necessary to perform the function of checking the defibrillator electrodes. Philips, on the other hand, contends that the impedance measuring circuit 100, the electrode connector 32, the real time clock 79, and the A/D converter 102 are necessary structures to perform the function of checking the defibrillator electrodes.

The patent specification provides that "[t]he interconnection and operability of the electrodes 50 is checked by monitoring the impedance signals provided by impedance measuring circuit 100." ('571 Patent at c. 5, ll: 12-15.) The patent also provides:

> Impedance measuring circuit 100 is connected to electrode connector 32 and real time clock 79, and is interfaced to processor 74 through analog-to-digital (A/D) converter 102. The impedance measuring circuit 100 receives a clock signal having a predetermined magnitude from clock 79, and applies the signal to electrodes 50 through connector 32. The magnitude of the clock signal received back from the electrodes 50 through connector 32 is monitored by impedance measuring circuit 100. An impedance signal representative of the impedance present across electrode connector 32 is then generated by circuit 100 as a function of the ratio of the magnitudes of the applied and received clock signals (i.e., the attenuation of the applied signal).

(*Id*. at c. 4, ll: 20-33.) Philips asserts that because the impedance signals do not go directly from the processor to the impedance measuring circuit — rather, they go through an A/D converter, which translates the analog signals from the impedance measuring circuit into digital signals for the processor — the A/D converter is a necessary part of the structure for performing the function of checking the electrodes. Moreover, Philips argues that the impedance measuring circuit uses the signal from the real time clock, delivered through connector 32, to measure the impedance of the electrodes.

The Court agrees with Philips that in order to perform the function of checking the electrodes, the language of the specification requires a necessary structure that is more than just the impedance measuring circuit. The language that Cardiac Science relies upon states that the interconnection and operability of the electrodes is "checked by monitoring the impedance signals provided by impedance measuring circuit 100." (*Id*. at c. 5, ll: 12-15.) Based on this language, the structure that performs the checking function incorporates the structure that monitors the impedance signals. The processor is the structure that monitors the impedance signals. With these considerations in mind, the Court finds that the structures necessary to perform the function of checking the electrodes are the impedance measuring circuit, the electrode connector, and the A/D converter. Consistent with the Court's construction of the electrode connection means, the Court finds that a clock is not necessary to perform the function of checking the electrodes.

7. "actuating"

Claim 1 of the '571 Patent discloses self-test means for "actuating the maintenance indicator if a malfunctioning component is identified." Philips asserts that "actuating" should be construed as "mechanically moving the maintenance indicator to identify a malfunction." Cardiac Science contends that "actuating" means "activating."

The dictionary defines "actuate" as "to put into mechanical action or motion"; and "to move to action." Merriam-Webster's Collegiate Dictionary, *supra*, at 13. The maintenance indicator of the '571 Patent is "switched to its maintenance required state by processor 74 if faults are identified during the lid closed self-test." ('571 Patent at c. 7, ll: 15-17.) The Court finds that Philips' construction attempts to import the commercial embodiment of the '571 Patent into the claim construction. But neither the specification nor the claim language limits the term "actuating" to a "mechanical" movement of the maintenance indicator when a malfunction is identified. The Court finds that in the context of the '571 Patent, the term "actuating" should be construed as "activating or putting into motion."

8. "means for activating"

Claim 20 of the '571 Patent discloses a "means for activating the self-test means when opening or closing said lid." The parties agree that this element is in means-plus-function format, and thus is governed by 35 U.S.C. § 112, ¶ 6. The parties also agree that the corresponding function to this means clause is "activating the self-test means when opening or closing the case lid." In addition, the parties agree that a "lid" is "a removable or hinged cover for any compartment, receptacle, or enclosed space."

However, the parties dispute the structure that is necessary to perform this function. Cardiac Science contends that the corresponding structure is a lid switch.[2] Philips asserts that this element is indefinite because the structure for performing this function is not adequately described in the patent. Alternatively, Philips asserts that the corresponding structure disclosed in the specification is, specifically, the magnetic reed relay switch 90 because it is the only form of a "lid switch" that is described in the specification.[3]

As a preliminary matter, the Court finds that the structure for performing this function is adequately disclosed. The '571 Patent provides that "[t]he opening of the lid 28 is detected by lid switch 90, which effectively functions as an on/off switch." ('571 Patent c. 4, ll: 57-58.) In response, processor 74 performs the lid-opened self-test. (*Id*. at 58-66.) The specification also states that the closing of the lid activates the processor's "lid-closed self-test." (*Id*. at c. 6, ll: 65-67.) Thus, the lid switch is the structure necessary for activating the self-test means.

Philips asserts that the magnetic reed relay switch is the only structure that the specification links with the recited function. However, the language of the specification contradicts this argument. The specification states that "[l]id switch 90 is a magnetic reed relay switch in one embodiment . . .." (*Id*. at c. 3, ll: 53-54.) Thus, the specification contemplates the use of other types of lid switches. For these reasons, the Court finds

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[2] The parties agree that a "lid switch" is "a device that detects and signals the state of the lid (open or closed)."

[3] Philips initially asserted that processor 74 is part of the structure required to perform this means limitation. However, Philips disavowed this contention in its later briefing. (Philips' Opp'n to Cardiac Science, Inc.'s Opening *Markman* Brief at 16, n.3.)

that the structure necessary to perform the function of activating the self-test means when opening or closing said lid is a lid switch.

9. "real-time clock"

Claim 5 of the '571 Patent discloses a "real-time clock"[4] that "provid[es] communication to the digital control system enabling the digital control system to maintain track of the steps of the rescue mode of operation." The parties dispute the meaning of this language. Philips asserts that the phrase should be construed as meaning that "for each step of the rescue mode, the digital control system checks the real time clock to keep track of the steps." In other words, Philips contends that for each of the five steps taught in the patent, the real time clock provides a time that is stamped in the digital control system to keep track of the steps. Cardiac Science, however, asserts that "to maintain track" should be defined as "marking the occurrence," and that the rest of the claim limitation speaks for itself.

The specification states that "[s]tored data representative of the operation of defibrillator 10 includes the real time of the occurrence of" the events that the device performs. ('571 Patent c. 7, ll: 59-66.) In other words, the digital control system maintains track of these steps by marking the real time of the occurrences. The Court

[4] Similar to the dispute regarding the '969 Patent, Philips argues that the real-time clock of Claims 5 and 7 of the '571 Patent is a device that keeps track of the actual date and time, and not just elapsed time. Cardiac Science asserts that the real-time clock is a component that keeps track of time, but that need not be actual time. The '571 and '969 Patents specifications are identical in their description of the real-time clock. ('571 Patent c. 7, ll: 59-66; c: 8, ll: 8-10.) Consistent with its construction of the real-time clock in the '969 Patent, the Court construes the "real-time clock" of the '571 Patent to mean "a clock that keeps track of the actual date and time."

construes this limitation as "for each step of the rescue mode, the digital control system checks the real time clock to mark the occurrence of each step."

10. "magnetic reed relay switch"

Dependent Claim 23 of the '571 Patent discloses a "magnetic reed relay switch." Cardiac Science asserts that this term should be construed as "a magnetically operated switch." Philips contends that the term should be construed as "a reed switch combined with a coil to create a relay."

Both parties rely upon the same dictionary definition to support their constructions. The IEEE 100 defines "reed relay" as a "relay using glass-enclosed magnetically closed reeds as the contact members. Some forms are mercury wetted." IEEE 100 Authoritative Dictionary of IEEE Standards Terms at 941 (7th ed. 2000). Philips also asserts that magnetic reed relay switches are known in the art to be a particular type of magnetic switch that has reeds and a coil. However, aside from one unsubstantiated Internet reference and another company's data sheet that cites a coil requirement, Philips offers no support from the patent itself. Neither the IEEE definition nor the patent makes reference to a coil or, more specifically, a copper coil. On the other hand, Cardiac Science's definition adds nothing to the meaning of the term. The Court construes the term "magnetic reed relay switch" as "a relay switch that uses magnetically closed reeds as the contact members."

11. "lead wires with connectors extending from the package"

Claims 1, 3, 4, and 10 of the '571 Patent describe "lead wires with connectors extending from the package." Philips asserts that this term should be construed as "a

round wire covered by an electrically insulating material, such as polyvinyl chloride, and having two ends used to connect two points in a circuit, the lead wires having connectors on the end that are outside the package." Cardiac Science contends that this term should be construed as "lead wires and connectors extend from electrode package."

The electrodes are sealed in packages that must remain sealed so that the gel on the electrodes (which ultimately forms the contact with the rescue patient) does not dry out. Yet, the self-test requires electrical contact between the AED and the packaged electrodes, so that the self-test can reach the electrodes inside and determine whether electrical conductivity still exists. The lead wires and the connectors extending from the package provide this contact.

The patent specification describes the preferred embodiment as follows:

> Insulated lead wires 56 extend from each electrode 50, and have a first end connected to the conductive sheet and a second end connected to connector 58. Connector 58 is configured to releasably mate with the electrode connector 32 in electrode compartment 26. Electrodes 50 are sealed within a polymer or polymer-metal laminate package 60 such as that shown in FIG. 2. Lead wires 56 and connector 58 extend from package 60.

(*Id*. at c. 2, ll: 50-58.) Based on this language, Philips argues that the wires extend from the package, with the connectors completely outside the package. Cardiac Science, on the other hand, asserts that the connectors may merely reach outside the package with the lead wires contained completely within the package.

The Court finds that the claim language contemplates that the connectors extend outside the package. However, the connectors do not have to "completely" extend outside the package, as Philips contends. The Court need not limit the claim construction

to the preferred embodiment. Consistent with the plain language of the claim, the Court construes this term as "the lead wires and the connectors extend, at least partially, from the electrode package."

C. The '085 Patent

The '085 Patent, entitled "Charging and Safety Control for Automated External Defibrillator and Method," was issued on February 22, 2000. The '085 Patent describes a safety circuit for AEDs that allows for earlier charging of the capacitors, and thus quicker release of a defibrillation shock than prior methods. ('085 Patent at 1.) The fail-safe safety circuit protects against unintentional discharge of the defibrillator.

The disputed claims of the '085 Patent read as follows:

> 1. An automated external defibrillator comprising:
> a charging circuit for preparing and temporarily storing a defibrillation shock;
> a manually actuated trigger switch mechanism for generating a defibrillation shock release request signal;
> monitoring and analysis means operably communicatively coupled to the trigger switch mechanism for pre-qualifying release of a defibrillation shock in response to the defibrillation shock release request signal from the trigger switch mechanism; and
> a safety switch mechanism operably communicatively coupled to the trigger switch mechanism, separately responsive to the defibrillation shock release request signal from the monitoring and analysis means, for connecting a pre-qualified release of a defibrillation shock to patient electrode terminals.
>
> . . .
>
> 16. A method for providing a defibrillation shock using an automated external defibrillator having AED circuitry including an electrical power supply interconnected to a charging circuit capable of preparing and temporarily storing a defibrillation shock, a pair of electrodes connected to the charging circuit, a processor for controlling operation of the AED, an analysis circuit connected to the processor, and a trigger switch operably

> coupled to the AED circuitry for initiating generation of a defibrillating shock, the method including the steps of:
>
> turning the AED on;
>
> activating the charging circuit to prepare and store a defibrillation shock;
>
> instigating the analysis circuit simultaneously to the actuation of the charging circuit; and
>
> generating the defibrillating shock, deliverable to a patient.

('085 Patent at c. 6, ll: 28-43; c. 8, ll: 44-61.)

1. "instigating the analysis circuit simultaneously to the actuation of the charging circuit"

Claim 16 of the '085 Patent describes the method for delivering a defibrillating shock, including a step of "instigating the analysis circuit simultaneously to the actuation of the charging circuit." Philips contends that this term should be defined as "performing analysis for the first time when the high voltage capacitor begins to charge." Cardiac Science asserts that the term "instigate" should be construed as "trigger or provoke" and "actuation" means "activation." Cardiac Science offers no further construction of the phrase.

The '085 Patent specification reads:

> The provision of additional safety controls to prevent the inadvertent release of a defibrillation shock reduces the need for the prior art method of sequential charging of the capacitors of the charging circuit, only after the completion of monitoring and analysis by the processor. Instead, the charging system may begin simultaneously with the monitoring and analysis function of the processor.

('085 Patent at c. 6, ll: 3-9.) However, contrary to Philips' proposed construction, neither the specification nor the claim language requires that the analysis be performed "for the first time" when the high voltage capacitor begins to charge. Rather, the word

"simultaneously" in the claim language, coupled with the specification, describes the analysis occurring at the same time as the high voltage capacitor begins to charge. Thus, the Court construes the term "instigating the analysis circuit simultaneously to the actuation of the charging circuit" as "performing analysis at the same time as the high voltage capacitor begins to charge."

2. "safety switch mechanism . . . for connecting a pre-qualified release of a defibrillation shock to patient electrode terminals"

Claim 1 of the '085 Patent discloses a "safety switch mechanism . . . for connecting a pre-qualified release of a defibrillation shock to patient electrode terminals." As to the claim construction of this term, Philips contends that Claim 1 describes "a safety switch that connects a 'pre-qualified release' of a defibrillation shock to patient electrode terminals." Thus, Philips argues that "the safety switch does not close until after the processor receives the defibrillation shock release request and pre-qualifies release of the defibrillation shock." Cardiac Science initially asserted that no construction of this term was required. Just prior to the *Markman* hearing on this matter, however, Cardiac Science asserted that "safety switch mechanism" should be defined as "a fail-safe device that requires two shock release requests before it will allow the AED capacitors to deliver a defibrillation shock to the electrodes attached to the patient."[5]

[5] Philips objects to Cardiac Science's proposed construction on the terms of the '085 Patent, on the grounds that Cardiac Science's new constructions were barred by the Court's April 28, 2005 Order (Court Doc. No. 172) and because the Court previously denied Cardiac Science's attempt to submit these constructions through additional briefing. (Court Doc. No. 377.) The Court sustains Philips' objections. The Court's

(Footnote Continued on Next Page)

Philips argues that the safety switch does not close until after the processor receives the defibrillation shock release request and pre-qualifies release of the defibrillation shock. Philips points to Figure 2 of the '085 Patent and to the specification in support of its construction. The patent specification describes the safety switch mechanism as follows:

> Processor 30 functions to receive monitoring signals, analyze the signals and if appropriate, close switches 26*(a)* and 26*(b)*. Signals which are monitored preferably include impedance between electrodes connected to terminals 24*(a)* and 24*(b)* and fitted to a patient's chest. The acceptable and appropriate impedance is within the range which should be observable across a patient's chest cavity. Only when the impedance is within preset parameters does the processor 30 allow switches 26*(a)* and 26*(b)* to be closed. Processor 30 also monitors and analyses the patient's cardiac electrical output. Only if the monitored cardiac signal, also preferably received from electrodes connected to patient electrode terminals 24*(a)* and 24*(b)*, is identified as a ventricular fibrillation condition, does the processor 30 allow the switches 26*(a)* and 26*(b)* to be closed.

(Footnote Continued From Previous Page)
April 28, 2005 Order specifically stated that Cardiac Science would submit alternate claim constructions to Philips by April 29, 2005. (April 28, 2005 Order at 1.) The Court stated that, "[t]o the extent that Cardiac Science provides no alternate claim construction for the terms and phrases identified solely by Philips as needing to be construed, it will be precluded from later offering a new construction." (*Id*.) The Court also denied Cardiac Science's attempt to later submit additional constructions after new counsel took over representation of Cardiac Science on this matter. (January 6, 2006 Order). Clearly, Cardiac Science was not allowed, by virtue of the Court's orders, to provide alternative claim construction after April 29, 2005. Consistent with the Court's January 6, 2006 Order, and in the interest of fairness, the Court is not willing to reconsider these issues at this late stage of the proceedings.

As a result of sustaining Philips' objections, the Court will not consider Cardiac Science's proposed constructions, submitted on the eve of the *Markman* hearing. Rather, the Court will consider Philips' proposed construction, Cardiac Science's objections to Philips' proposed construction, and Cardiac Science's previous argument that no construction of these terms was required.

> The processor 30 is in communication with a manual trigger switch or "rescue switch" 32. The rescue switch 32 is manually actuated by rescue personnel to signal the processor 30 to release and deliver a defibrillation shock if the processor's criterion [sic] for release and delivery have been met. In effect, the processor serves to control a pre-qualification of release of a defibrillation shock.
>
> The rescue switch 32 also independently closes switches 28*(a)* and 28*(b)* to allow the shock to be released. This independent closure serves as a significant safety check against inadvertent shock delivery which might result from a malfunction at the processor 30. In effect, the independent closure serves as a fail safe device to assure that an emergency medical operator has indeed requested that a defibrillation shock be delivered if the processor's pre-qualification criterion [sic] have been met.

(*Id*. at c. 4, l: 58-c. 5, l: 21.)

The Court agrees with Philips' proposed construction. The safety switch mechanism is depicted in Figure 2 as switches 28(a) and 28(b). When the processor receives signals from the electrodes that a patient is in fibrillation, the processor recognizes that a shock is appropriate. When the shock is pre-qualified and the rescue switch 32 is manually actuated, the processor closes switches 26(a) and 26(b). And the closure of the rescue switch and safety switches 28(a) and 28(b) allows the shock to be delivered to the patient.

Thus, the Court construes "safety switch mechanism," consistent with Philips' proposed construction, as "the safety switch does not close until after the processor receives the defibrillation shock release request and pre-qualifies release of the defibrillation shock."

3. "safety switch mechanism . . . separately responsive to the defibrillation shock release request signal"

Claim 1 of the '085 Patent describes the safety switch mechanism as "separately responsive to the defibrillation shock release request signal." Philips asserts that this phrase should be construed as "the safety switch responds to the signal from the trigger switch, without input from the monitoring and analysis circuit." In its briefing,[6] Cardiac Science contends that this phrase should be construed consistent with its construction of the previous term. In other words, Cardiac Science asserts that "safety switch mechanism" should be construed as "a fail safe device that requires two shock release requests before it will allow the AED capacitors to deliver a defibrillation shock to the electrodes attached to the patient."

The Court agrees with Philips that the specification requires safety switches 28(a) and 28(b) to close without input from the processor. ('085 Patent at c. 5, ll: 13-21.) The specification describes the manually actuated trigger/rescue switch as the source of the signal to release the defibrillation shock. (*Id*. at c. 5, ll: 6-11.) Then, the rescue switch independently closes the safety switches to allow the shock to be released. (*Id*. at c. 5, ll: 13-14.) As noted in Figure 2, the safety switches are not connected to the processor. Thus, the safety switch responds to the signal from the trigger switch without input from the processor (i.e., the monitoring-and-analysis circuit). This is consistent with the specification, which states that the independent closure protects against malfunctions in

[6] Consistent with the Court's remarks in the previous term, the Court will not consider Cardiac Science's arguments that occurred on the eve of the *Markman* hearing.

the processor that otherwise could result in inadvertent shock delivery to a patient. (*Id.* at c. 5, ll: 14-17.) Accordingly, the Court construes this phrase as "the safety switch responds to the signal from the rescue/trigger switch without input from the monitoring and analysis circuit."

D. The '884 Patent

The '884 Patent, entitled "Medical Electrode Packaging Technology," was issued on April 4, 1995. ('884 Patent at 1.) The patent generally describes a sealed package structure for housing a medical electrode apparatus that allows for the periodic testing of the electrode without breaking the seal of the package. (*Id*.)

The disputed claims of the '884 Patent read as follows:

> 1. A sealed packaged medical electrode system for use with an electro-medical device and which permits easy periodic testing of electrode electrical viability without being opened, comprising:
>
> (a.) a first disposable electrode for placement on a patient's body and connection to the electro-medical device, including:
>
> i) a flat, thin, non-conductive base layer;
>
> ii) a conductive semi-liquid gel layer disposed on a side of said base layer, said gel layer being for contact with a patient; and
>
> iii) conductive connection means communicatively connected to said gel layer;
>
> (b.) a second disposable electrode for placement on a patient's body and connection to the electro-medical device, including:
>
> i) a flat, thin, non-conductive base layer;
>
> ii) a conductive semi-liquid gel layer disposed on a side of said base layer, said gel layer being for contact with a patient; and
>
> iii) conductive connection means communicatively connected to said gel layer;
>
> (c.) a thin, generally flat flexible envelope constructed and arranged to form an interior cavity for enclosing said first and second electrodes, said envelope being constructed entirely of a non-gas permeable polymeric material, and
>
> (d.) said first and second electrode connection means extending outwardly through said envelope, and said first and second electrode

> gel layers being oriented in a face to face relationship for electrical communication therebetween, so that current loop is formable between said first electrode connection means, said first electrode gel layer, said second electrode gel layer, and said second electrode connection means without opening said envelope.
>
> 2. The packaged electrode system of claim 1, wherein said first and second electrode connection means is an insulated wire, the conductive wire portion of which contacts said gel layer.

('884 Patent at c. 8, ll: 1-40.)

1. "conductive connection means communicatively connected to said gel layer"

Claim 1 of the '884 Patent describes first and second disposable electrodes including "conductive connection means communicatively connected to said gel layer." Cardiac Science maintains that this phrase should be construed as "configured to enable electrical connection to the gel layer." Philips, on the other hand, asserts that this is a means clause subject to 35 U.S.C. § 112, ¶ 6, and that the functions of the clause are communicatively connecting to the gel layer and extending outwardly through the envelope. Further, Philips asserts that the structure corresponding to this function is a round wire covered by an electrically insulating material, such as polyvinyl chloride, that (1) is in direct contact with the gel layer, without the use of conductive contact layer, such as a homogenous, thinly deposited metallic layer, a conductive ink material, or a flexible metal mesh; and (2) starts inside the package, and continues through and beyond the package periphery.[7]

[7] Philips asserts that this term should be construed consistently with the terms "electrically interconnected to the conductive gel layer" and "communicatively coupled to the gel layer" from the '919 and '102 Patents, respectively. Thus, some of the Court's

(Footnote Continued on Next Page)

Philips is correct in asserting that Figures 13 and 14 are the only designs disclosed in the '884 Patent that use two electrodes that are placed together in a face-to-face relationship, consistent with the language of Claim 1. ('884 Patent at sheet 4.) In this embodiment, electrodes 128 and 129 each have two layers. Electrode 128 consists of non-conductive base layer 130 and conductive gel layer 131; electrode 129 consists of non-conductive base layer 133 and conductive gel layer 134. (*Id*.) The two layers are sandwiched together and separated by resistive layer 137. (*Id*.) In these drawings, the insulated lead wires 132 and 135 connect directly to conductive gel layers 131 and 134. (*Id*.)

The principal dispute regarding this term, and the somewhat corresponding terms of the '919 and '102 Patents, is whether these terms are restricted to two layers, as represented in Figures 13 and 14 of each of the patents. Philips argues that during the prosecution of the '884 and '919 Patents, Cardiac Science surrendered its claims for electrodes with a conductive layer between a base and conductive gel layer, and thus the construction of these terms is limited to a two-layer embodiment.

During the prosecution of the '884 Patent, the patent examiner specifically withdrew claims of electrodes with "a second conductive layer" because they were "drawn to a non-elected species." (Axtell Ex. 25 at CSI 000076-77.) After that withdrawal, the applicants cancelled the "second conductive layer," a.k.a., the "three-

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(Footnote Continued From Previous Page)
discussion of these terms will include language regarding all three patents — the '884, '919, and '102 Patents — and thus will overlap.

layer" claims. (*Id*. at CSI 000105.) The applicants then added the so-called "two-layer" claims, which required the "connection means" to be "communicatively connected to said gel layer." (*Id*. at CSI 000087.) The application with these changes issued as the '884 Patent.

A divisional application was also filed just before the '884 Patent issued. The PTO restricted the application (Axtell Ex. 23 at CSI 0001081), and the applicants elected to prosecute claims directed to Figures 13 and 14. (*Id*. at CSI 0001084.) The PTO responded by stating that none of the claims read on the elected species. (*Id*. at CSI 0001088.) The PTO requested further clarification, stating, "Each of the independent claims recite an electrode comprising a base layer, a conductive contact layer overlying the base layer and a gel layer overlying the contact layer. The elected species does not show or disclose this three layer combination." (*Id*.) The applicants amended the claims to remove the additional conductive contact layer. (*Id*. at CSI 0001090-93.) Similar to the '884 Patent, the claims were also amended to include an insulated lead wire "electrically interconnected to the conductive gel layer." (*Id*. at CSI 0001090-1094.) This application issued as the '919 Patent.

Just before the '919 Patent issued, the applicants filed a continuation-in-part application that included additional text and drawings. (Axtell Ex. 27 at CSI 000302.) The application recited the same two-layer claims as the previous applications. (*Id*. at CSI 000322-29.) This application issued as the '102 Patent.

Philips asserts that Cardiac Science's proposed construction of the terms "communicatively connected," "electrically interconnected," and "communicatively

coupled" to the gel layer are too broad. To some extent, Philips is asking the Court to engage in an infringement analysis, as Philips asserts that its electrodes are comprised of three layers and that Cardiac Science disavowed a three-layer construction during the prosecution of the '884, '919, and '102 Patents. Cardiac Science asserts that its responses to restrictions were not disavowals of claim scope.

At least one court has held that if the record demonstrates that the PTO examiner restricted the species elected, the applicant's "subsequent election of claims may constitute an avowed understanding that those claims were directed to that subject matter." *R2 Med. Sys., Inc. v. Katecho, Inc.*, 931 F. Supp. 1397, 1439 (N.D. Ill. 1996). The Court recognizes that *R2* is not binding precedent, and that the Federal Circuit has not yet confronted this issue. And, disavowal or not, the Court has "broad power to look as a matter of law to the prosecution history of the patent in order to ascertain the true meaning of language used in the patent claims[.]" *Markman*, 52 F.3d at 980.

The Court has reviewed the prosecution history of the patents at issue. Here, the examiner expressly identified the elected species as being limited to two-layer embodiments, and the applicants subsequently elected two-layer claims. Although Cardiac Science did not contest the PTO's restriction or request for clarification redirecting the inventors to claims that matched Figures 13 and 14, the election of the broader, two-layer elected species did not constitute an express disavowal or disclaimer of the more specific, three-layer embodiment. *See Omega Eng'g, Inc.*, 334 F.3d at 1323-26. Yet, the Court can consider the prosecution history to determine how the PTO and the inventor understood the patent. *Philips*, 415 F.3d at 1317. The Court finds that here,

the claim language at issue does not require the Court to incorporate into the construction of the terms at issue whether an express disavowal of the three-layer claims occurred. This discussion will be more appropriate for an infringement analysis than directed to claim construction of the terms that are at issue.

Thus, the Court returns to the claim construction of "conductive connection means communicatively connected to said gel layer." The Court finds that this phrase is not in a means-plus-function format because there is no clearly identified function. *See York Prods., Inc. v. Cent. Tractor Farm & Family Ctr.*, 99 F.3d 1568, 1574 (Fed. Cir. 1996) (absent an identified function, the term "means" does not trigger 35 U.S.C. § 112, ¶ 6). The "conductive connection means" describes the structure of the invention that is in contact with the electrode's gel layer. In the only embodiment of the '884 Patent that describes the two-electrode system, this phrase specifically refers to the leads that extend from the conductive gel layers. ('884 Patent at c. 7, ll: 30-47.) "Communicatively connected" refers to the manner in which the leads link the current loop from the electrodes to the AED, so that the viability of the electrodes may be tested without opening the electrode envelopes. (*Id*. at c. 7, ll: 48-51.) The Court finds that "conductive connection means communicatively connected to said gel layer" should be construed as "a conductive lead or leads that are configured to enable electrical connection to the gel layer."

2. "conductive semi-liquid gel layer"

Claim 1 of the '884 Patent discloses a "conductive semi-liquid gel layer." Philips asserts that this term should be construed as "a thickness of semi-liquid material having

low resistance." Cardiac Science asserts that the term should be defined as "a thickness of conductive semi-liquid materials."

The specification refers to several brand-name compounds that share the characteristics of the conductive gel layer, as contemplated by the patent. ('884 Patent c.5, ll: 6-9.) The specification states that "[g]enerally, these compounds have low resistivities." (*Id*. at c. 5, ll: 6-7.) However, the Court finds no support in the patent specification to limit the conductive gel layer to a certain low resistance, as Philips suggests. (Tr. at 214.) And the term "conductive" speaks for itself. Thus, the Court finds that the term "conductive semi-liquid gel layer" is appropriately construed as "a thickness of conductive semi-liquid materials."

3. "the conductive wire portion of which contacts said gel layer"

Claim 2 of the '884 Patent describes the "connection means" of Claim 1 as an insulated wire, "the conductive wire portion of which contacts said gel layer." Cardiac Science maintains that "conductive wire portion of which contacts said gel layer" should be construed as "electrically connected to the gel layer." Philips contends that this phrase should be construed as "conductive wire portion of insulated wire is in direct contact with the gel layer, without the use of a conductive contact layer, for example an intermediate metallic layer." Philips also renews its disclaimer arguments, as discussed in Section II.D.1, above.

The Court finds that "conductive wire portion of which contacts said gel layer" should be construed as "the conductive wire portion of the insulated wire that is in contact with the gel layer." The phrase needs no further construction.

4. "electrode connection means extending outwardly through said envelope"

Claim 1 of the '884 Patent describes "first and second electrode connection means extending outwardly through said envelope." Philips asserts that this is a means clause subject to 35 U.S.C. § 112, ¶ 6. Philips contends that the function of this means clause is communicatively connecting to the gel layer and extending outwardly through the envelope. Philips submits that the structure necessary to perform this function is a round wire covered by an electrically insulating material, such as polyvinyl chloride, that (1) is in direct contact with the gel layer, without the use of a conductive contact layer, such as a homogenous, thinly deposited metallic layer, a conductive ink material, or a flexible metal mesh; and (2) starts inside the package, and continues through and beyond the periphery. In support of its construction, Philips renews its disclaimer arguments as set forth in Section II.D.1, above. Cardiac Science, on the other hand, maintains that this term is not a means clause within 35 U.S.C. § 112, ¶ 6, because the claim specifies no function. Cardiac Science further asserts that the term should be construed as "an electrical contact."

As a preliminary matter, the Court finds that this term is a means clause subject to 35 U.S.C. § 112, ¶ 6. The recited function is providing an electrical connection from the gel layer to outside of the sealed electrode envelope. The corresponding structures

necessary to perform this function are the leads that extend out through the package so that electrical contact from the outside can occur. ('884 Patent at Fig. 13; c. 7, ll: 30-47.) Moreover, the insulated wires or electrical leads start inside the envelope and extend from the inside to the outside of the envelope.

5. "testing"

The term "testing" from Claim 1 of the '884 Patent is also at issue. Philips contends that "testing" should be construed as "checking continuity between the defibrillator electrodes using a test apparatus." Cardiac Science contends that "testing" need not be construed, but if it is, it should be defined as "making a critical examination, observation, or evaluation."

The claim language plainly states that the "testing" of the '884 Patent refers to testing the electrodes, but this can be derived from the context of the word "testing," without needing to incorporate "electrode testing" into the disputed term. The preferred embodiment describes the "test apparatus" as follows:

> The test apparatus 13 includes a current source 23, preferably a battery, test circuitry 24, preferably including measurement components and status indication components such as an analog meter, LCD digital display or light emitting diodes, and connectors 21 and 22 for coupling with the package 12 connectors 19 and 20. In use, the test apparatus 13 is connected to the package connectors 19 and 20. The test circuitry 24 is then activated to form a closed current loop to determine whether continuity exists with respect to the enclosed electrode 11, thereby indicating whether the electrode 11 is still functional. Additionally, a load 86 formed of for example a conductive and semi-conductive material layers 85 and 86, may be added to the current loop as for example is shown in FIG. 17, for purposes of measuring the magnitude of current flow for more precise measurement of electrode 11 condition.

('884 Patent at c. 5, ll: 49-66.) Based on this language, Philips maintains that this term requires the testing to be completed by a test apparatus. However, only the preferred embodiment states this requirement. Neither the claim language nor the specification demands that the "testing" of the electrodes utilize a test apparatus. The Court finds that the term "testing" should be construed as "checking or evaluating."

E. The '919 Patent

The '919 Patent, entitled "Medical Electrode Packaging Technology," was issued on December 3, 1996. ('919 Patent at 1.) The '919 Patent issued from a divisional application from the application that issued as the '884 Patent. (*Id*. at c. 1, ll: 4-5.) The '919 Patent generally describes a sealed package system for housing an electrode apparatus that allows for periodic testing of the electrodes without breaking the seal of the package. (*Id*. at c. 1, ll: 9-34.)

The disputed claims of the '919 Patent read as follows:

> 1. A packaged disposable defibrillator electrode, including:
> a first disposable defibrillator electrode, comprising:
> a base layer; and
> a patient-engaging conductive gel layer overlaying the base layer;
> a first insulated lead wire having first and second ends, the first end mounted to the first electrode and electrically interconnected to the conductive gel layer, and the second end configured for electrical interconnection to a defibrillator; and
> a generally gas-impermeable package surrounding the first electrode and the first end of the first lead wire to protect the first electrode prior to use, with the first lead wire extending from the package to enable the second end to be interconnected to a defibrillator prior to the opening of the package and use of the first electrode.
> 2. The packaged disposable defibrillator electrode of claim 1 and further including:
> a second disposable defibrillator electrode, comprising:
> a base layer; and

a patient-engaging conductive gel layer overlaying the base layer;

a second insulated lead wire having first and second ends, the first end mounted to the second electrode and electrically interconnected to the conductive gel layer, and the second end configured for electrical interconnection to a defibrillator; and

the package also surrounds the second electrode and the first end of the second lead wire to protect the second electrode prior to use, with the second lead wire extending from the package to enable the second end to be interconnected to a defibrillator prior to the opening of the package and use of the second electrode.

3. The packaged disposable electrode of claim 2 wherein the conductive gel layers of the first and second electrodes are electrically interconnected to one another within the package to form an electrical circuit between the second ends of the first and second lead wires and enable testing of the electrical characteristics of the first and second electrodes prior to the opening of the package.

4. The packaged disposable electrode of claim 3 wherein:

the first and second electrodes are positioned within the package with the conductive gel layers oriented toward one another; and

the invention further includes a separator layer between the conductive gel layers of the electrodes to enable the electrical interconnection of the conductive gel layers.

. . .

8. The packaged disposable defibrillator electrode of claim 1 wherein:

the base layer of the first electrode includes a layer of flexible, nonconductive material; and

the conductive gel layer includes an adhesive conductive gel layer.

. . .

12. A packaged set of disposable defibrillator electrodes, including:

a pair of disposable defibrillator electrodes, each electrode comprising:

a flexible, nonconductive base layer;

a conductive adhesive gel layer overlaying the base layer; and

an insulated lead wire having first and second ends, the first end fixedly mounted to the electrode and electrically interconnected to the conductive gel layer, and the second end configured for electrical interconnection to a defibrillator;

a separator layer between the pair of electrodes, wherein the gel layers of the electrodes are adhesively secured to opposite sides of the separator layer; and

a generally gas-impermeable package surrounding the pair of electrodes, the separator layer and the first ends of the lead wires, to protect the electrodes prior to use, wherein the lead wires extend from the package to enable the second ends to be interconnected to a defibrillator prior to the opening of the package and use of the electrodes.

. . .

16. The packaged set of electrodes of claim 12 wherein the separator layer enables the electrical interconnection of the gel layers to form an electrical circuit between the second ends of the lead wires and enable testing of the electrical characteristics of the electrodes prior to the opening of the package.

17. A packaged set of disposable defibrillator electrodes, including:

a pair of disposable defibrillator electrodes, each electrode comprising:

a flexible, nonconductive base layer;

a conductive adhesive gel layer overlaying the base layer; and

an insulated lead wire having first and second ends, the first end fixedly mounted to the electrode and electrically interconnected to the conductive gel layer, and the second end configured for electrical interconnection to a defibrillator;

a separator layer between the pair of electrodes, wherein the gel layers of the electrodes are adhesively secured to opposite sides of the separator layer and the separator layer enables the electrical interconnection of the gel layers to form an electrical circuit between the second ends of the lead wires and enable testing of the electrical characteristics of the electrodes prior to the opening of the package; and

a generally gas-impermeable package surrounding the pair of electrodes, the separator layer and the first ends of the lead wires, to protect the electrodes prior to use, wherein the lead wires extend from the package to enable the second ends to be interconnected to a defibrillator prior to the opening of the package and use of the electrodes.

('919 Patent c. 7, l: 33 – c. 8, l: 14; c. 8, ll: 25-31, 42-63; c. 9, l: 7 – c. 10, l: 16.)

1. "electrically interconnected to the conductive gel layer"

Claims 1, 12, and 17 of the '919 Patent describe an insulated lead wire that is "electrically interconnected to the conductive gel layer." Philips asserts that this phrase should be construed as "in direct contact with the gel layer, without the use of a conductive contact layer, such as a homogeneous thinly deposited metallic layer, a conductive ink material, or a flexible metal mesh." Philips renews its disclaimer arguments set forth in Section II.D.1, above. Cardiac Science contends that the term should be defined as "configured to enable electrical connection to the gel layer."

The Court finds that "electrically interconnected to the conductive gel layer" merely means that one end of the insulated lead wire enables electrical connection to the gel layer.

2. "conductive gel layer"

Claims 1, 3, 4, 8, and 12 of the '919 Patent describe a "conductive gel layer." The parties' arguments are identical to those regarding the "conductive semi-liquid gel layer" of the '884 Patent.[8] Consistent with the claim language, the specification, and the Court's construction of the term in the '884 Patent, the Court construes "conductive gel layer" as "a thickness of conductive semi-liquid materials."

[8] The '919 patent describes the conductive gel layer in c. 4, ll: 53-64. The specification is identical to the '884 Patent in this regard.

3. "overlaying the base layer"

Claims 1, 2, 12, and 17 of the '919 Patent describe either "patient-engaging conductive gel layer" or "conductive adhesive gel layer" "overlaying the base layer." The parties dispute the meaning of the term "overlaying the base layer." Cardiac Science asserts that "overlaying" means "spread over." Philips renews its disclaimer argument set forth in Section II.D.1, above, and contends that "overlaying the base layer" should be defined as "spread directly on the surface of the base layer (i.e., without any conductive contact layer, such as a homogeneous, thinly deposited metallic layer, a conductive ink material, or a flexible metal mesh, between the gel layer and the base layer)."

The main dispute among the parties is whether the term "overlaying" requires the gel layer to be spread directly on the base layer, or whether there may be another structure in between. The specification offers no support for this term's construction other than Figures 13 and 14, which demonstrate that the gel layer is spread directly on the base layer. The dictionary defines "overlay" as "to lay or spread over or across." Merriam-Webster's Collegiate Dictionary, *supra*, at 885. The inventors did not specify that the gel layer "directly" overlays the base layer. Thus, the Court finds that in the context of the '919 Patent, the term "overlaying" is construed consistent with its common meaning, as "laid or spread over."

4. "separator layer"

Claim 4 of the '919 Patent discloses "a separator layer between the conductive gel layers of the electrodes to enable the electrical interconnection of the conductive gel layers." Claim 16 of the '919 Patent, a dependent claim, discloses a packaged set of

electrodes wherein "the separator layer enables the electrical interconnection of the gel layers to form an electrical circuit." The parties agree that "a separator layer between the conductive gel layers of the electrodes" means "a thickness of material that physically separates the gel layers of the electrodes." It appears undisputed that the separator layer allows the rescuer to physically separate the first electrode from the second electrode before applying the electrodes to the patient. However, the parties dispute the further qualities of the "separator layer." Philips contends that "the separator layer is conductive to facilitate a low impedance path between the electrodes." Cardiac Science, on the other hand, asserts that "the separator layer is a liner that permits an electrical connection between the two gel layers."

Philips also asserts that the separator layer is a solid layer that physically separates the gel layers of the two electrodes and does not allow them to touch. Further, Philips asserts that the layer must be formed of a conductive/resistive material. ('919 Patent at c. 7, ll: 19-20.) The Court finds no merit to Philips' arguments. First, neither the claim language nor the specification requires that the separator be a continuous layer. Second, although the preferred embodiment describes the "conductive/resistive" properties of the separator layer, the Court finds no reason to import this embodiment into the structure. The context of the two claims that include the separator layer specify that the separator layer "enables the electrical interconnection" of the gel layers. Thus, the term "separator layer" speaks for itself and needs no further construction.

5. "the second end configured for electrical interconnection to a defibrillator"

Claim 1 of the '919 Patent describes an insulated lead wire with two ends, "the second end configured for electrical interconnection to a defibrillator." Claims 2, 12, and 17 contain similar language. The parties dispute the meaning of this term. Cardiac Science contends that it refers to a "wire configured to enable electrical connection to the defibrillator." Philips asserts that it should be construed as "the second end of the insulated lead wire having a connector designed to be plugged into a defibrillator."

Philips contends that the terms at issue here relate to the '919 Patent's requirement that the packaged electrodes be "interconnected to the defibrillator" — or "pre-connected" — prior to use. Philips relies on a decision from the United States District Court for the Central District of California, which held that the '919 Patent's claims were likely to be found invalid because the claimed invention of pre-connecting the electrode to a defibrillator was not described in the '919 Patent specification. *Cardiac Science v. Zoll Med. Corp*., Case No. 02-2514 SVW (CTx) (N.D. Ca. Jul. 15, 2002).

The Court finds that the decision in *Cardiac Science v. Zoll Med. Corp.* is neither relevant nor binding to this Court's claim construction of this term. The Court further finds that the language of the claim and the specification does not require that the insulated lead wire have a connector that can plug into a defibrillator, as Philips contends. The Court finds that the plain language of the claim merely requires that the second end of the insulated lead wire allows for electrical interconnection to the defibrillator.

6. "to enable the second end to be interconnected to a defibrillator"

Likewise, Claim 1 of the '919 Patent describes an insulated lead wire that extends from the package "to enable the second end to be interconnected to a defibrillator prior to the opening of the package and use of the first electrode." Claims 2, 12, and 17 contain similar language. Philips construes this language to mean "such that the connector on the end of the lead wire is outside the package, allowing it to be plugged into a defibrillator." Cardiac Science, on the other hand, asserts that the term "interconnect" means "connect" and that this clause "provides a functional definition of 'extending from the package,' the preceding term."

Similar to the Court's discussion of the previous term, the Court finds no support in Philips' argument that this term should be construed to include some kind of "plugging in" requirement. The clause in which the phrase appears already recognizes that the second lead wire extends from the package. The term otherwise requires that the lead wire extends from the package in a manner that allows for interconnection to the defibrillator prior to use of the electrode. No further construction is required.

7. "lead wire extending from the package"

Claim 1 of the '919 Patent describes a "first lead wire extending from the package to enable the second end to be interconnected to a defibrillator prior to the opening of the package and use of the first electrode." Claims 12 and 17 contain similar language. Philips asserts that the "lead wire extending from" language means that the insulated wire starts inside the package, and continues through and beyond the package periphery.

Cardiac Science contends that "lead wire extending from" language should be construed as "the wire is configured to enable electrical connection to a defibrillator through an unopened electrode package."

Consistent with the Court's construction of the "electrode connection means" of the '884 Patent, *supra*, the Court finds that the term "lead wire extending from the package" is properly construed as "the insulated wires or leads start inside the envelope and extend from the inside to the outside of the envelope."

8. "insulated lead wire having first and second ends"

Claims 1, 12, and 17 of the '919 Patent disclose an "insulated lead wire having first and second ends." Philips asserts that this term should be defined as "a round wire covered by an electrically insulating material, such as polyvinyl chloride, and having two ends used to connect two points in a circuit." Cardiac Science maintains that a "lead wire" is a "conductive wire, trace, or strip."

The Court finds no support for Philips' assertions that the term should be construed to include a "round" wire covered by a specific insulating material. These descriptors merely impart limitations from the preferred embodiment into the claim construction. In the specification, the "wire lead" deals with the electrical contact that is made between the gel layer and the AED. However, this need not be a lead wire with "two ends used to connect two points in a circuit." The Court finds that the term is properly described as an "insulated conductive wire."

9. "testing"

Claims 3 and 17 of the '919 Patent describe "testing of the electrical characteristics" of the electrodes. Philips asserts that "testing" should be defined as "checking continuity between the defibrillator electrodes using a test apparatus." Cardiac Science asserts that "testing" should be defined as "making a critical examination, observation, or evaluation."

The description of the preferred embodiment states:

> The test apparatus 13 includes a current source 23, preferably a battery, test circuitry 24, preferably including measurement components and status indication components such as an analog meter, LCD digital display or light emitting diodes, and connectors 21 and 22 for coupling with the package 12 and connectors 19 and 20. In use, the test apparatus 13 is connected to the package connectors 19 and 20. The test circuitry 24 is then activated to form a closed current loop to determine whether continuity exists with respect to the enclosed electrode 11, thereby indicating whether the electrode 11 is still functional. Additionally, a load 86 is formed of for example a conductive and semi-conductive material layers 85 and 86, may be added to the current loop as for example is shown in FIG. 17, for purposes of measuring the magnitude of current flow for more precise measurement of electrode 11 condition.

('919 Patent at c. 5, ll: 33-50.) The Court construes "testing" of the '919 Patent consistent with its construction of the term in the '884 Patent. The Court finds that the term "testing" should be construed as "checking or evaluating."

F. The '102 Patent

The '102 Patent, entitled "Medical Electrode Packaging Technology," was issued on November 16, 1999. ('102 Patent at 1.) The application for the '102 Patent was a continuation-in-part of the application that issued as U.S. Patent No. 5,850,920, which was a divisional application of the application that matured into the '919 Patent, which in

turn was a divisional application of the application that matured into the '884 Patent. Generally, the '102 Patent describes a pre-packaged electrode system with facing gel layers of two electrodes, interposed by a conductive layer from which the gel layers can readily release. (*Id*. at c. 1, ll: 44-50.)

The claims in dispute in the '102 Patent read as follows:

> 1. Packaged medical electrodes for use with an electro-medical device comprising:
> a first electrode having;[sic]
> a base layer;
> a gel layer disposed on the base layer;
> a conductive connector communicatively coupled to the gel layer;
> a second electrode having;[sic]
> a base layer;
> a gel layer disposed on the base layer;
> at least one conductive connector communicatively coupled to the gel layer;
> the gel layers of the first and second electrodes being disposed in a facing relationship and having a liner interposed therebetween, the liner physically separating the gel layers of the first and second electrodes and conductively coupling the gel layers of the first and second electrodes; and
> a package enclosing the first and second electrodes.
> 2. The packaged electrodes of claim 1 further including at least two conductive devices, a first conductive device being communicatively coupled to the gel layer of the first electrode and a second conductive device being communicatively coupled to being communicatively coupled [sic] to the gel layer of the second electrode, the conductive devices being selected from a group consisting of:
> wire leads; and
> snap connectors.

('102 Patent at c. 8, ll: 2-30.)

1. "communicatively coupled"

The term "communicatively coupled to the gel layer" appears in Claims 1 and 2 of the '102 Patent. Cardiac Science asserts that this term should be construed as

"configured to enable electrical connection to the gel layer." Philips contends that this phrase should be defined as "the wire is in direct contact with the gel layer, without the use of a conductive contact layer, such as an intermediate metallic layer." Philips renews its disclaimer arguments as set forth in Section II.D.1, above.

The Court construes "communicatively coupled" to mean "configured to enable electrical connection to the gel layer."

2. "disposed on the base layer"

Claim 1 of the '102 Patent describes a first electrode with a gel layer "disposed on the base layer." Philips renews its disclaimer arguments as to this term, as set forth in Section II.D.1, above, and further asserts that this term should be construed as "spread directly on the surface of the base layer (i.e., without any conductive contact layer, such as a homogeneous, thinly deposited metallic layer, a conductive ink material, or a flexible metal mesh, between the gel layer and the base layer)." Cardiac Science contends that "disposed on" means "placed on."

Similar to the Court's construction of the term "overlaying the base layer" in the '919 Patent, the Court finds that the '102 Patent does not state that the gel layer is *directly* disposed on the base layer, as Philips contends. The '102 Patent specification offers no further support, other than the illustrations at Figures 13 and 14, which are merely embodiments of the patent. The dictionary defines "dispose" as "to put in place." Merriam-Webster's Collegiate Dictionary, *supra*, at 361. Consistent with the dictionary definition of the term, the Court construes the term "disposed on the base layer" as "placed on the base layer."

3. "liner physically separating the gel layers of the first and second electrodes"

Claim 1 of the '102 Patent describes a "liner physically separating the gel layers of the first and second electrodes." Cardiac Science asserts that "separating" should be defined as "dividing." Philips contends that this term should be construed as "a liner spacing apart the gel layers so they are not in physical contact with each other." Similar to its arguments regarding the "separator layer" of the '919 Patent, Philips contends that the liner of the '102 Patent does not allow the gel layers of the two electrodes to touch. The parties do not dispute that the liner allows the rescuer to physically peel apart the first electrode from the second electrode before applying each sticky, gel-coated electrode to the patient.

Unlike the "separator layer" of the '919 Patent, the plain meaning of the claim language "physically separating" requires the "liner" to be a continuous layer that prevents the gel layers from contacting each other. Thus, the Court finds that as to the "physically separating" element, the term "liner physically separating the gel layers of the first and second electrodes" requires a liner that "spaces apart the gel layers so that they are not in physical contact with each other."

4. "liner . . . conductively coupling the gel layers of the first and second electrodes"

Claim 1 of the '102 Patent also describes the "liner . . . conductively coupling the gel layers of the first and second electrodes." Cardiac Science contends that this term should be construed as "a liner configured to enable an electrical connection between the two gel layers." Philips, on the other hand, asserts that the liner is "made of conductive

material that permits electrical signals to pass from one gel layer to the other through the liner."

Unlike the separator layer of the '919 Patent, the '102 Patent specification repeatedly refers to its liner as a "conductive liner." ('919 Patent at c. 6, ll: 61-67; c. 7, ll: 1-22, 29-31, 46-63.) Moreover, the use of the phrase "conductively coupling" in the claim language reinforces the construction that the liner, itself, is conductive. Thus, the Court construes the phrase "liner . . . conductively coupling the gel layers of the first and second electrodes" as "a liner made of conductive material that permits electrical signals to pass from one gel layer to the other through the liner."

5. "wire lead"

Claim 2 of the '102 Patent describes "wire leads." Philips asserts that this term should be construed as "a round wire having two ends used to connect two points in a circuit." Cardiac Science contends that the term should be defined as "a conductive wire, trace, or strip."

Consistent with the Court's construction of the "insulated lead wire" at issue in the '919 Patent, the Court does not find support for Philips' assertion that the wire be "round." The Court finds that this term is properly construed as "conductive wire."

G. The '616 Patent

The '616 Patent, entitled "Field Programmable Automated External Defibrillator," was issued on July 11, 2000. ('616 Patent at 1.) The patent generally describes an automated external defibrillator with a method by which the operating parameters may be selectively altered. (*Id*. at c. 1, ll: 13-16.)

The claims at issue in the '616 Patent read as follows:

> 12. An automated external defibrillator (AED) for delivering defibrillation shocks to a patient, comprising:
> a power source;
> a processor connected to the power source;
> a power generation circuit connected to the power source and the processor and including a high voltage generation circuit;
> an electrode connector in electrical communication with the power generation circuit and configured to be connected to a plurality of electrodes for conductive engagement with the patient;
> patient monitoring circuitry in electrical communication with the electrode connector and the processor;
> a program memory connected to the processor and including at least one alterable AED operating parameter; and
> connecting means to an exterior information storage medium, the external storage medium configured to include said at least one alterable AED operating parameter, said alterable AED operating parameter being altered by implementing software installed in an external computer, said connecting means including a port configured for connecting the external computer to the processor.
>
> . . .
>
> 14. The AED of claim 12, further comprising electrode testing circuitry configured to be communicatively coupled to the electrode connector and the processor.

(*Id*. at c. 16, ll: 3-26, 32-34.) Claim 14 is the only claim at issue in the '616 Patent, but as a dependent claim, it incorporates all of the limitations of Claim 12.

1. "alterable"

Claim 12 of the '616 Patent describes a program memory that includes "at least one alterable AED operating parameter." The parties dispute the meaning of the word "alterable." Philips asserts that "alterable" should be construed as "able to be modified or changed to different values in the field by a user." Cardiac Science contends that "alterable" should be defined as "able to be modified or changed." Thus, the dispute is

over the use of "to different values in the field by the user" in Philips' proposed construction.

In support of its construction, Philips points to the following language from the specification:

> Such alterations should be capable of being performed locally in the field after the AED has been delivered to the end user.

('616 Patent at c. 1, ll: 46-48.)

> The present invention substantially meets the aforementioned needs of the industry by providing a parameter altering capability. These alterations may be performed locally in the field without recourse to factory assistance.

(*Id*. at c. 1, ll: 51-55.)

> The AED includes apparatus for altering at least one AED operating parameter value in the field, the operating parameter value being programmed in the microprocessor. The apparatus for altering is an information storage medium disposed operationally exterior to said case and that is selectively communicatively coupled to the microprocessor.

(*Id*. at c. 2, ll: 7-13.)

> An advantage of this capability is that this update may be readily made in the field, without the need to remove the AED 10 from service and return it to the factory for update.

(*Id*. at c. 14, ll: 26-29.)

> Being able to update the AED 10 in the field by means of a data card 29, ensures that all AED's 10 are readily configured with the latest software program improvements without being removed from service in order for the update to be installed.

(*Id*. at c. 14, ll: 35-39.)

The Court finds support in the specification for Philips' construction that the AED parameters can be changed "in the field." The title of the patent further reflects this

intent. However, the Court sees no other support to limit the claim in the manner Philips suggests. Thus, the Court construes "alterable" as "able to be modified or changed in the field."

2. "connecting means to an exterior information storage medium"

Claim 12 describes an AED that may be programmed by an external computer through a "connecting means to an exterior information storage medium." Cardiac Science asserts that this phrase should be construed as "a connector." Philips maintains that this is a means clause governed by 35 U.S.C. § 112, ¶ 6, and Philips asserts that the function of this means clause is to connect the AED to a storage medium outside the AED. Philips contends that the structure necessary to perform this function includes the serial connector port 23, connectors 114 and 116, and serial cable 112.

The Court agrees with Philips that this term is in means-plus-function format, subject to 35 U.S.C. § 112, ¶ 6. Cardiac Science has not rebutted the presumption created by the use of the word "means" in the claim element. *See, e.g., CCS Fitness, Inc. v. Brunswick Corp.*, 288 F.3d 1359, 1369 (Fed. Cir. 2002). The function of the means clause is to connect the AED to an exterior storage medium, as explicitly stated in the claim language. Cardiac Science does not dispute that if the term is in a means-plus-function format, the structure performing that function is serial connector port 23, connectors 114 and 116, and serial cable 112. (Tr. at 420.) Thus, the Court finds that Philips' construction is proper.

H. The ‘809 Patent

The ‘809 Patent, entitled, “Defibrillator Battery with Memory and Status Indication Guage[sic],” was issued on April 2, 2002. (‘809 Patent at 1.) The patent generally describes a defibrillator that includes a battery with a memory component to be used with the defibrillator to indicate the status of the battery. (*Id*. at c. 1, ll: 12-15.)

The claims at issue in the ‘809 Patent read as follows:

> 1. A defibrillator battery comprising:
> at least one battery cell;
> a housing surrounding the at least one battery cell; and
> a memory connected to the at least one battery cell, the memory storing a first parameter of how much energy is used by a defibrillator in a standby mode on a daily basis, a second parameter of how much energy is used by the defibrillator during active operation per minute, and a third parameter of how much energy is used by the defibrillator charging up a capacitor bank.
>
> . . .
>
> 7. A method of monitoring status of a lithium battery in an automated external defibrillator comprising:
> providing an automated external defibrillator having a battery status indication gauge and a lithium battery;
> tracking an amount of use of the battery in the defibrillator and determining the remaining energy capacity of the battery by comparing the amount of use against pre-determined energy use parameters of the battery and the defibrillator;
> displaying the remaining energy capacity of the battery by illumination of the battery status indication gauge.

(‘809 Patent at c. 7, l: 63-67 – c. 8, l: 5; c: 8, ll: 51-59.)

1. **"first parameter of how much energy is used by a defibrillator in a standby mode on a daily basis"**
2. **"second parameter of how much energy is used by the defibrillator during active operation per minute"**
3. **"third parameter of how much energy is used by the defibrillator charging up a capacitor bank"**

Claim 1 of the '809 Patent describes a defibrillator battery with a memory that stores a series of parameters, including "a first parameter of how much energy is used by a defibrillator in a standby mode on a daily basis," "a second parameter of how much energy is used by the defibrillator during active operation per minute," and "a third parameter of how much energy is used by the defibrillator charging up a capacitor bank." Cardiac Science asserts that "parameter" should be the only word construed in these terms, and that the term should be defined consistently as "a characteristic." Philips, on the other hand, contends that each "parameter" clause of Claim 1 should be defined specifically. Philips maintains that the "first parameter" should be defined as "a value that represents the predetermined energy used during each day of standby operation." Philips asserts that the "second parameter" should be defined as "a value that represents the predetermined energy used during each minute of active operation." Finally, Philips contends that the "third parameter" should be construed as "a value that represents the predetermined energy used during each charge of the high voltage capacitor."

Philips cites the specification in support of its proposed construction. Specifically, Philips points to the following language:

> Memory component 18 of battery pack 15 stores information regarding: (1) the initial capacity of battery cells 16; (2) a parameter of the amount of energy used per day by AED 10 in a dormant, standby mode; (3) a

> parameter of the amount of energy used pre minute during active operation of AED 10; and (4) a parameter of the amount of energy used to charge up "shocking" capacitors of the AED 10 in preparation of delivering a shock.

('809 Patent at c. 4, ll: 22-29.) Further, Philips notes that the specification describes an example calculation formula that represents the "predetermined energy used" for each individual parameter. (*Id*. at c. 4, ll: 38-58.) Cardiac Science asserts that Philips is merely attempting to import matter from the specification into the claim language.

Although the Court recognizes that the specification provides specific examples of possible ways that these parameters could be narrowed, the Court sees no basis for limiting the construction of the claim terms to those examples. The claim language promotes a broader reading and points to the common meaning of the term: "an independent variable." Merriam-Webster's Collegiate Dictionary, *supra*, at 899. Moreover, the context of each "parameter" clause provides sufficient language to construe the claims. Thus, the Court finds that "parameter" is properly defined as "an independent variable," and the remaining language of each "parameter" clause needs no further definition.

4. "tracking an amount of use of the battery"

Claim 7 of the '809 Patent describes a method of monitoring the status of an AED battery that comprises "tracking an amount of use of the battery" in the AED. Philips asserts that this term should be construed as "storing information in memory relating to use of the battery." Cardiac Science, on the other hand, contends that this term needs no construction.

Philips asserts that the specification makes clear that tracking battery use involves storing the battery use information in memory so that the battery gauge will accurately reflect the remaining battery life. Philips points to the following language from the specification in support of its construction:

> Memory component 18 of battery pack 15 stores information regarding: (1) the initial capacity of battery cells 16; (2) a parameter of the amount of energy used per day by AED 10 in a dormant, standby mode; (3) a parameter of the amount of energy used per minute during active operation of AED 10; and (4) a parameter of the amount of energy used to charge up "shocking" capacitors of the AED 10 in preparation for giving a shock. The memory component 18 also stores information regarding: (1) the amount of time AED 10 has been in active operation with battery pack 15; (2) the amount of time the battery pack 15 has been in service (including in standby mode and active operation); and (3) the number of charges that have been delivered by AED 10 with battery pack 15. Based on this information, the amount of energy remaining in the plurality of cells 17 is calculated.

('809 Patent at c. 4, ll: 22-37.) The specification then describes an equation for calculating the remaining power in the battery pack based on the identified parameters. (*Id*. at c. 4, l: 38 – c. 5, l: 8.) Further, Philips points to the following language from the specification:

> Of course, both the lid open and lid closed test consume energy from battery pack 15. Processor 74 tracks this use of battery energy using the parameters identified above and updates memory component 18 of battery pack 15 so that status indicator gauge 60 accurately reflects the ongoing battery usage of AED 10.

(*Id*. at c. 6, ll: 41-46.)

Cardiac Science asserts that Philips improperly attempts to import a limitation from a dependent claim into an independent claim. Specifically, Cardiac Science contends that storing battery information in memory is recited in Claim 8, which reads:

> 8. The method of claim 7 wherein the step of tracking and determining further comprises storing the amount of use and the predetermined energy use parameters in memory associated with the battery.

(*Id*. at c. 8, ll: 62-65.) Cardiac Science further maintains that the specification distinguishes checking the charge state of the battery from storing the information in memory. (*Id*. at c. 6, ll: 1-15.) Thus, Cardiac Science argues that the doctrine of claim differentiation renders Philips' importation of Claim 8 into Claim 7 improper. Philips responds to this argument by asserting that Claim 7 does not require storing information in battery memory, because other memory in the defibrillator may be used. Thus, Philips contends that Claim 7 is broader in scope than Claim 8.

The Court finds that "tracking an amount of use of the battery" should not be construed to include storing information in memory, as Philips proposes. The "tracking" step of Claim 7 is distinguishable from the "tracking" step of Claim 8. To import storage into the tracking step of Claim 7 would render Claim 8 superfluous. Moreover, the Court agrees with Cardiac Science that the language of the "tracking" term speaks for itself and needs no further construction.

I. The '576 Patent

The '576 Patent, entitled, "Automated External Defibrillator with the Ability to Sense Temperature," was issued on April 27, 1999. ('576 Patent at 1.) Generally, the patent describes an AED with a temperature sensing circuit that senses the temperature of the AED battery and adjusts the operation of the AED according to the sensed temperature. (*Id*. at c. 1, ll: 11-17.)

Claim 13 is the only disputed claim of the '576 Patent. It reads as follows:

13. An automated external defibrillator (AED) with the ability to sense temperature comprising:
an AED housing;
a battery proximate to the housing;
a temperature sensing circuit having a temperature sensor, said temperature sensing circuit located adjacent to said battery and temperature sensing circuit designed to sense the temperature inside of said battery; and
a processor interfaced to said temperature sensing circuit, said processor designed to enable adjustment of operating parameters of the AED according to the sensed temperature.

(*Id*. at c. 8, ll: 41-53.)

1. "located adjacent to said battery"

Claim 13 describes an AED with a battery and a temperature sensing circuit that is "located adjacent to said battery." The parties dispute the meaning of the term "adjacent." Philips asserts that "adjacent" should be defined as "adjoining or next to the battery, with nothing of the same kind in between." Cardiac Science contends that "adjacent" means "close," but does not require that the temperature sensing circuit needs to touch the battery. Philips agrees that the temperature sensing circuit does not need to touch the battery, but contends that Cardiac Science's definition is not precise enough. (Tr. at 444.)

The claim itself provides some guidance as to the proximity required between the battery and the temperature sensors, as the claim describes a "temperature sensing circuit designed to sense the temperature inside of said battery." ('576 Patent at c. 8, ll: 47-48.) However, nothing in the claim language or the specification requires that the temperature sensors adjoin the battery, as Philips proposes. The Court finds that "located adjacent to"

is properly construed as "close to," as in "located close to the battery so that it may sense the temperature of the battery."

J. The '281 Patent

The '281 Patent, entitled "State and Stage Monitoring Automated External Defibrillator," was issued on December 23, 1997. ('281 Patent at 1.) Generally, the patent describes an AED capable of monitoring the states and stages of a rescue. (*Id*. at c. 1, ll: 12-15.)

The claims in dispute in the '281 Patent read as follows:

> 1. An automated external defibrillator (AED) having a packaged pair of electrodes electrically connected together, wherein the AED is capable of monitoring the state it is in, the AED comprising:
>
> a case;
>
> an electrode terminal mounted to the case;
>
> a high voltage circuit contained in the case and electrically connected to the electrode terminal; and
>
> a control system coupled to the electrode terminal and the high voltage circuit wherein the control system includes state detection means for determining the state of the AED, said states being (1) the AED is being used for a rescue and (2) the AED is not being used for a rescue.
>
> . . .
>
> 19. An automated external defibrillator (AED) having a packaged pair of electrodes electrically connected together, the AED being capable of performing a cardiac arrest rescue procedure on a patient, the rescue procedure having a plurality, of rescue stages, the AED comprising:
>
> a case;
>
> an electrode terminal mounted to the case;
>
> a high voltage circuit contained in the case and electrically connected to the electrode terminal; and
>
> a control system coupled to the electrode terminal and the high voltage circuit wherein the control system includes stage monitoring means for monitoring the specific stages of a cardiac arrest rescue procedure.

. . .

22. The AED of claim 19 wherein the control system monitors at least the rescue stages of (1) rescue initiated, (2) preparing victim, (3) applying electrodes, (4) AED in use, and (5) rescue completed.

. . .

27. A method of monitoring the stage of a rescue procedure utilizing an automated external defibrillator (AED) having rescue stage monitoring means wherein the AED has a case, an electrode terminal mounted to the case, a high voltage circuit contained in the case and electrically connected to the electrode terminal, and a control system coupled to the electrode terminal and the high voltage circuit wherein the control system includes the stage monitoring means, and wherein the control system contains an internal clock and memory means, the method including the steps of:

(a) polling the AED to determine if the AED is on;
(b) using the internal clock to identify when the AED is turned on;
(c) storing in the memory means the time from the internal clock when the AED is turned on;
(d) measuring the resistance at the electrode terminal;
(e) determining a rescue stage from the measured resistance;
(f) identifying the time the rescue stage began with the internal clock; and
(g) recording in the memory means the time of the rescue stage.

(*Id*. at c. 10, ll: 13-27; c. 12, ll: 26-40, 59-62; c. 13, ll: 33-46 – c. 14, l: 10.)

1. "state detection means for determining the state of the AED"

Claim 1 of the '281 Patent describes a control system that includes "state detection means for determining the state of the AED." The parties agree that this is a means clause governed by 35 U.S.C. § 112, ¶ 6. However, the parties dispute the function of the means clause and the structure corresponding to that function. Cardiac Science contends that the function of the means clause is "determining the state of the AED," and the corresponding structure is a processor. Philips asserts that the function of the clause is

"determining the state of the AED, said states being (1) the AED is being used for a rescue or (2) the AED is not being used for a rescue." Philips maintains that the structural element is indefinite because the structure that actually performs the recited function is not adequately disclosed. Alternatively, Philips argues that the structure that performs this function includes magnetic reed relay switch 90, processor 74, impedance measuring circuit 100, analog-to-digital converter 102, and real time clock 79.

The Court agrees with Cardiac Science that the function of this means clause is explicitly stated in the claim language as "determining the state of the AED." The remaining language of the claim that Philips attempts to import — namely, the specific states that the state detection means are detecting — is nonfunctional language and thus not properly incorporated.

As to the structure corresponding to this function, the specification states:

> AED 22 of the present invention is programmed to monitor for two basic states. The first state is when AED 22 is not being used for a rescue, and the second state is when AED 22 is being used for a rescue. In the first state, processor 74 initiates and performs a self-test which will then detect the presence of fresh electrodes 50, as described above. In the second state, when the AED is being used for a rescue, processor 74 monitors the rescue features.

(*Id*. at c. 8, ll: 19-26.) Philips asserts that the specification does not link any structure to the function of detecting the state of the AED. Then, Philips argues that if any structure is linked, it must include the lid switch, the digital processor, the impedance measuring circuit, and the real time clock. Cardiac Science, on the other hand, asserts that the processor is the "programmable component that contains the algorithm to distinguish between the states of the AED," and that the specification identifies no other structures

necessary to perform this function. (Cardiac Science's Opening *Markman* Brief at 11-12.) However, Cardiac Science does not cite to any part of the specification in support of this assertion.

The Court finds that Philips is correct in asserting that the patent does not adequately disclose the structure that performs the function of determining the state of the AED. Although the specification states that the processor detects the presence of electrodes and "monitors the rescue features" ('281 Patent at c. 8, ll: 19-26), the specification offers no description as to how the AED determines the state of the AED, or the structure that is used to make that determination. Thus, the Court finds that this "means" element is indefinite because the patent does not link any structure to the function of determining the state of the AED. *See, e.g., B. Braun Med., Inc.*, 124 F.3d at 1424-25.

2. "stage monitoring means"

Claim 22 (by virtue of its dependence on Claim 19) and Claim 27 of the '281 Patent disclose "stage monitoring means for monitoring the specific stages of a cardiac arrest rescue procedure." The parties agree that these are means-plus-function clauses governed by 35 U.S.C. § 112, ¶ 6. In addition, the parties do not dispute that the function claimed in the elements is "monitoring the specific stages of a cardiac arrest procedure." However, the parties dispute the structure associated with that function. Cardiac Science asserts that the corresponding structure is a processor. Philips, on the other hand, asserts that the corresponding structures include real time clock 79, analog-to-digital converter 102, electrodes 50, impedance measuring circuit 100, and processor 74.

Cardiac Science asserts that the structure it identified in the state detection means — the processor — also performs the stage monitoring function. Cardiac Science points to the following language from the specification in support of its contention:

> In addition to monitoring the state of the AED, electrodes 50 of the present invention are coupled with detection means to determine a specific stage of a cardiac arrest rescue procedure. Specifically, AED 22 has the ability to determine which of at least five stages the AED is at during a rescue procedure.

('281 Patent at c. 8, ll: 28-33.) Philips, on the other hand, asserts that the AED monitors rescue stages by measuring the impedance of the electrodes. Philips asserts that the electrodes 50, noted in column 8, are coupled to the processor through the impedance measuring circuitry. Philips also points to the following language from the specification:

> The present invention has the impedance values that indicate what stage a rescue procedure is in stored in memory such that, if necessary a rescue procedure can be entered in the middle of any stage and the AED is able to identify the stage and proceed accordingly.

(*Id*. at c. 9, ll: 1-5.) Thus, Philips maintains that the circuitry for measuring impedance values is necessary for the AED to monitor the rescue stages.

The Court finds that Philips is correct in asserting that the additional elements are necessary structures to perform the function of monitoring the stages of the cardiac arrest rescue procedure. Column 9 describes how the invention uses the impedance values to indicate the stage of the rescue procedure. (*Id*. at c. 9, ll: 1-5.) And, the specification specifically states that the electrodes "are coupled with detection means" to determine a specific stage of a cardiac arrest rescue procedure. (*Id*. at c. 8, ll: 28-31.) The electrodes are coupled to the processor through the impedance measuring circuitry, and therefore

necessary to monitor the stages. (*See id*. at sheet 6, Fig. 8.) Thus, the Court finds that all of these structures are necessary to perform the function of monitoring the stages. These structures include the analog-to-digital converter 102, electrodes 50, impedance measuring circuit 100, and processor 74. The real-time clock, however, is merely used as a voltage source and is not necessary to perform the function of monitoring the stages.

3. "determining a rescue stage from the measured resistance"

Claim 27 of the '281 Patent discloses a method of monitoring the stage of a rescue procedure of an AED including a step of "determining a rescue stage from the measured resistance." The parties dispute the meaning of this phrase. Philips asserts that the phrase should be construed as "measuring the impedance at the electrodes and comparing the measured impedance to stored values to determine which of the five rescue stages the AED is in." Cardiac Science contends that the word "stage" means "step," and that no further construction is necessary.

The specification teaches that the impedance values indicate the stage of a rescue procedure. ('281 Patent at c. 9, ll: 1-5.) Specifically, the AED compares the impedance values to stored values and then determines the stage of rescue. (*Id*. at c. 9, ll: 17-46.) Thus, the Court construes "determining a rescue stage from the measured resistance" as "measuring the impedance at the electrodes and comparing the measured impedance to stored impedance values to determine which stage the AED is at during a rescue procedure."

III. The Philips Patents

A. The '374 Patent

The '374 Patent, entitled, "External Defibrillator with Automatic Self-Testing Prior to Use," was issued on March 9, 1999. ('374 Patent at 1.) The patent generally describes an AED that performs periodic functional, calibration, and safety self-tests. (*Id*. at c. 1, ll: 14-19.)

The disputed claim language of the '374 Patent reads as follows:

> 1. An external defibrillator comprising:
> a high voltage delivery system comprising an energy source, an electrode interface and a switch connecting the energy source to the electrode interface;
> a controller operably connected to the high voltage delivery system; and
> a self-test system comprising a defibrillator status indicator, a test signal generator, and means for operating the defibrillator status indicator and the test signal generator prior to any attempted use of the defibrillator.
>
> . . .
>
> 25. The defibrillator of claim 22 wherein the system monitor further comprises means for generating periodic test signals.
>
> . . .
>
> 41. An external defibrillator comprising:
> a high voltage delivery system comprising an energy source, an electrode interface and a switch connecting the energy source to the electrode interface;
> a controller operably connected to the high voltage delivery system; and
> a self-test comprising a defibrillator status indicator, a periodic test signal generator, and means for operating the defibrillator status indicator and the periodic test signal generator prior to any attempted use of the defibrillator.

('374 Patent at c. 14, ll: 9-19; c. 15, ll: 43-45; c. 16, ll: 25-35.)

1. "means for generating periodic test signals"

Claim 25 of the '374 Patent describes a "means for generating periodic test signals." The parties agree that this term is in a means-plus-function format subject to 35 U.S.C. § 112, ¶ 6, and that the function claimed in the element is "generating periodic test signals." However, the parties dispute the structure that performs this function. Cardiac Science asserts that the structure necessary to perform the function includes a low power gate array, a custom application-specific integrated circuit, discrete logic components, or a low power CPU with or without discrete logic components. Philips, on the other hand, maintains that the structure linked to this function includes a clock/oscillator in combination with a low power gate array, ASIC, a low power CPU, and/or discrete logic. Thus, the only dispute is whether the clock/oscillator is necessary to generate periodic test signals.

The specification provides:

> Gate array 48 operates a 32.768 kHz crystal oscillator to provide the defibrillator testing system's scheduling function. The gate array divides the oscillator's frequency repeatedly to generate periodic (e.g., daily, weekly, monthly) test initiation signals.

(*Id*. at c. 5, ll: 21-25.) Philips contends that this language describes the oscillator being used as a timer to keep the signals periodic. Cardiac Science asserts that this portion of the specification does not describe the oscillator as part of the system monitor, but rather as a separate component that provides an initiating signal to the system monitor, which in turn issues the test signal.

The Court finds that the oscillator is necessary to perform the function of generating periodic test signals. The oscillator provides the signal to the gate array for the AED testing system's scheduling function. Thus, the oscillator is a structure that is necessary to perform the claimed function.

2. "means for operating the defibrillator status indicator and the [periodic] test signal generator prior to any attempted use of the defibrillator"

Claims 1 and 41 of the '374 Patent describe a "means for operating the defibrillator status indicator and the [periodic] test signal generator prior to any attempted use of the defibrillator." The parties agree that this is a means clause subject to 35 U.S.C. § 112, ¶ 6. The parties further agree that the recited function is operating the defibrillator status indicator and the test signal generator (or the periodic test signal generator of Claim 41) prior to any attempted use of the defibrillator. However, the parties dispute the structure necessary to perform this function. Philips asserts that the structure necessary to perform the functions of both Claim 1 and Claim 41 includes: (1) a system monitor circuit alone; or (2) a system monitor circuit and a controller (CPU). Philips further contends that the system monitor circuit can be implemented through a controller, gate array, or discrete logic. Cardiac Science asserts that the patent does not disclose any structure for performing the functions of both operating the status indicator and the periodic test signal generator. Thus, Cardiac Science asserts that this means limitation cannot be construed.

In support of its construction, Philips points to the following language from the specification:

> A system monitor mediates the external defibrillator's self-testing functions by watching for scheduled test times and unscheduled power-on events. The system monitor generates test signals periodically at scheduled times and in response to specified events. The system monitor is also responsible for operating a fail-safe defibrillator status indicator or display. The system monitor communicates test signals to the CPU via a communication channel, and the CPU controls and gathers information from tested defibrillator components via other communication channels, some of which pass through system gate array 56.
> . . .
>
> As shown in more detail in FIG. 4, the other major element of system monitor 42 is a low-power gate array 48. In this preferred implementation, gate array 48 is a 44-pin custom ASIC. Gate array 48 is preprogrammed to perform the functions of the system monitor. As an alternative, the system monitor could be implemented with a low power CPU and/or with discrete logic components.
>
> Gate array 48 operates a 32.768 kHz crystal oscillator to provide the defibrillator testing system's scheduling function. The gate array divides the oscillator's frequency repeatedly to generate periodic (e.g., daily, weekly, monthly) test initiation signals.

(*Id*. at c. 4, l: 60 – c. 5, l: 3; c. 5, ll: 14-25.) Further, Philips points to:

> System gate array 56 is a custom application specific integrated circuit (ASIC) that integrates many of the defibrillator's functions, such as display control and many of the instrument control functions, thereby minimizing the number of parts and freeing up main CPU time for use in other tasks. The system gate array could be replaced by discrete logic and/or another CPU, of course, as known in the art.

(*Id*. at c. 4, ll: 48-54.) According to Philips, this language describes that the system monitor is responsible for operating the status indicator and test signal generator. Alternatively, Philips asserts that the CPU, in combination with the system gate array, operates the test signal generator, as depicted in Figure 7 of the Patent. (*Id*. at sheet 6.)

As a preliminary matter, the Court agrees with Philips that a means-plus-function claim may assign two functions to the means that are performed by different structures

within the description. *See Asyst Tech., Inc. v. Empak, Inc.*, 268 F.3d 1364, 1372 (Fed. Cir. 2001). Here, the Court finds that Philips is correct in asserting that the system monitor circuit alone, or the system monitor circuit and a controller (CPU) are the corresponding structure to the function of operating the defibrillator status indicator and the (periodic) test signal generator prior to any attempted use of the defibrillator. The system monitor also could be implemented through a gate array, a controller, or discrete logic.

B. The '213 and '059 Patents

The '213 Patent entitled, "Defibrillator System Condition Indicator," was issued on January 7, 1997. ('213 Patent at 1.) The '059 Patent, also entitled, "Defibrillator System Condition Indicator," was issued on January 18, 2000. ('059 Patent at 1.) The '213 Patent and the '059 Patent share specifications. Both the '213 and the '059 Patents generally describe an AED that can test itself periodically to make sure that the AED will work properly when needed. ('213 Patent at c. 1, ll: 8-12; '059 Patent at c. 1, ll: 8-12.)

The claims at issue in the '213 Patent read as follows:

> 1. A defibrillator system comprising:
> a defibrillator, the defibrillator comprising a defibrillator circuit and an electrode interface, the defibrillator circuit comprising an energy source, the electrode interface comprising conductors in electrical communication with the energy source;
> means for periodically operating the energy source to discharge a test pulse through the conductors;
> a patient simulator communicating with the conductors;
> a test pulse analyzer communicating with the conductors and the patient simulator; and
> a fault indicator communicating with the test pulse analyzer.

. . .

5. The defibrillator system of claim 4 wherein the test pulse analyzer further comprises means for sensing an electrical parameter.

. . .

8. A defibrillator system comprising:
a defibrillator, the defibrillator comprising a defibrillator circuit and an electrode interface, the defibrillator circuit comprising an energy source, the electrode interface comprising conductors in electrical communication with the energy source;
means for periodically delivering a test signal through the conductors;
a patient simulator communicating with the conductors;
a test signal analyzer communicating with the conductors and the patient simulator; and
a fault indicator communicating with the test signal analyzer.

. . .

10. The defibrillator system of claim 8 wherein the means for periodically delivering a test signal comprises means for operating the energy source to discharge a test pulse through the conductors.

. . .

15. A defibrillator system comprising:
a defibrillator, the defibrillator comprising a defibrillator circuit and an electrode interface, the defibrillator circuit comprising an energy source, the electrode interface comprising conductors in electrical communication with the energy source;
means for periodically delivering a test signal through the conductors;
a patient simulator communicating with the conductors;
a test signal analyzer communicating with the conductors and the patient simulator; and
a fault indicator communicating with the test signal analyzer,
wherein the test signal is an ECG signal pattern.

. . .

17. A test system for a defibrillator, the system comprising:
an energy source;
conductors in electrical communication with the energy source;
means for periodically operating the energy source to discharge a test pulse through the conductors;

a patient simulator communicating with the conductors;
a test pulse analyzer communicating with the conductors and the patient simulator; and
a fault indicator communicating with the test pulse analyzer.

. . .

21. The system of claim 20 wherein the test pulse analyzer further comprises means for sensing an electrical parameter.

. . .

24. A test system for a defibrillator, the system comprising:
an energy source;
conductors in electrical communication with the energy source;
means for periodically delivering a test signal through the conductors;
a patient simulator communicating with the conductors;
a test signal analyzer communicating with the conductors and the patient simulator; and
a fault indicator communicating with the test signal analyzer.

. . .

26. The system of claim 24 wherein the means for periodically delivering a test signal comprises means for operating the energy source to discharge a test pulse through the conductors.

('213 Patent at c. 9, ll: 15-28, 35-37, 42-55, 58-61; c. 10, ll: 5-19, 35-47, 54-55; c. 10, l: 61 – c. 11, l: 5; c. 11, ll: 8-11.)

The claims at issue in the '059 Patent read as follows:

1. A method for maintaining a defibrillator comprising the following steps:
periodically delivering a test pulse in a defibrillator from an energy source through conductors to a patient simulator within the defibrillator automatically without external activation;
analyzing a signal detected at the patient simulator to determine a condition of the defibrillator; and
providing an indication of the condition of the defibrillator.

. . .

> 8. The method of claim 5 wherein step (1) comprises delivering a test pulse from an energy source to a patient simulator within the defibrillator.
>
> 9. The method of claim 8 wherein step (1) further comprises analyzing a signal received at the patient simulator to determine a condition of the defibrillator.

('059 Patent at c. 9, ll: 10-20; c. 10, ll: 10-15.)

1. "means for sensing an electrical parameter"

Claims 5 and 21 of the '213 Patent describe a test pulse analyzer that further comprises "means for sensing an electrical parameter." The parties agree that this is a means-plus-function clause, thereby invoking 35 U.S.C. § 112, ¶ 6, and that the function is "sensing an electrical parameter." However, the parties dispute the structure necessary to perform that function. Philips asserts that the corresponding structure is an analog-to-digital converter. Cardiac Science contends that the corresponding structure includes an A/D converter, a D/A converter, and three resistors, one of which is a patient-load simulator.

Philips contends that Figure 2 of the '213 Patent, read in conjunction with the specification, illustrate the analog-to-digital converter is the structure that performs the function of sensing an electrical parameter. Specifically, Philips points to the following language from the specification:

> The pulse transmitted by the electrodes through conductive gel layers 206 to test pads 208 is monitored by the test circuit 220 across a patient load simulator 236. The signal is reduced by a divider circuit and sent to microprocessor 218 via A/D converter 238.

('213 Patent at c. 5, ll: 60-64.) Cardiac Science, however, contends that Figure 2 demonstrates that the test circuit 220 comprises A/D converter 238, D/A converter 222,

and three resistors, one of these resistors being the patient-load simulator. (*Id.* at sheet 2, Fig. 2.)

The Court finds that test circuit 220 is the structure identified in the '213 Patent that senses the electrical parameters. However, not all elements of the test circuit actually perform the sensing function. For instance, the D/A converter transmits analog signals out of test circuit 220, but the D/A converter is not used to sense the signals coming in. (*Id*. at c. 5, ll: 16-19.) The resistors do not sense anything either; rather, they are used to reduce the voltage that the test circuit monitors. (*Id*. at c. 5, ll: 63-65.) Nor can the Court identify how the patient simulator resistor performs the function of sensing an electrical parameter. Thus, these elements are not necessary to perform the function of sensing an electrical parameter. The Court finds that it is only the A/D converter that senses an analog voltage and converts it to a digital value. Thus, the A/D converter is the structure necessary to perform the function of sensing an electrical parameter.

2. "patient simulator"

Claims 1, 8, 15, 17, and 24 of the '213 Patent and Claims 1, 8, and 9 of the '059 Patent describe an AED comprising a "patient simulator." The purpose of the patient simulator is to indicate the functionality of the defibrillator and electrodes without having to attach an external patient simulation unit. ('213 Patent at c. 1, l: 56 – c. 2, l: 10.) Philips asserts that "patient simulator" should be defined as "a circuit element (or elements) that substitutes for the presence of a patient to test operation of a system within the defibrillator. For example, a finite resistive load located across the electrode terminals can act as a patient simulator for testing a high voltage discharge." Cardiac

Science asserts that this term should be construed as "circuit element(s) that provide a patient-simulating load resistor and generate ECG signals."

The parties agree that a patient simulator can consist of both a resistor and an ECG signal generator. The primary dispute appears to be whether you need to have both, or if it can be one or the other, as Philip contends. Cardiac Science maintains that in order to properly test the device, a patient simulator must both generate an ECG signal and simulate the load resistance of a patient. Although the specification describes the patient simulator as generating an ECG signal, the Court need not limit the claim to the preferred embodiment. Moreover, the Court finds no merit to Cardiac Science's argument that prosecution estoppel bars consideration of Philips' proposed construction. The prosecution history demonstrates that a resistor, alone, could constitute a patient simulator. (*See* Axtell Exs. 74 and 75.)

Ultimately, the Court sees no reason to construe this claim as closely as the parties propose. In light of the claim language and the specification, the Court finds that "patient simulator" is properly construed as "circuit element/s that substitute for the presence of a patient to test operation of the defibrillator."

3. "test pulse"
4. "test signal"
5. "signal"

The Court is asked to construe three similar terms that appear in the '213 and '059 Patents: test pulse, test signal, and signal. The term "test pulse" appears in Claims 1, 10, 17, and 26 of the '213 Patent and Claims 1 and 8 of the '059 Patent. The purpose of the "test pulse" is to test the condition of the defibrillator and its electrodes. Philips asserts

that this term should be construed as "any pulse that is associated with testing." Cardiac Science maintains that this term should be defined as "a simulated shock." "Test signal" appears in Claims 8, 10, 15, and 24 of the '213 Patent.[9] The parties acknowledge that "test signal" differs in meaning from "test pulse," but each party presents a different proposed construction of "test signal." Cardiac Science asserts that "test signal" should be construed as "a simulated ECG signal." Philips contends that "test signal" should be construed as "any signal associated with testing." "Signal" appears in Claims 1 and 9 of the '059 Patent. Philips asserts that "signal" should be construed as "a detectable physical quantity or impulse (as voltage, current, or magnetic field strength) by which messages or information can be transmitted." Cardiac Science contends that "signal" should be defined as "a simulated ECG signal."

The specifications describe the test pulses as follows:

> If the system passes the ECG tests, it then performs a defibrillator test by generating a pulse through its normal pulse generating circuitry and sending the pulse to the electrodes 204. To initiate the pulse test, the microprocessor sends a charge command to a charge controller 230, which begins charging capacitor 232 in a known manner from power supply 234. When the charge on capacitor 232 has reached the required level (either the charge level required for normal operation or some other test charge level), switch relay 228 moves switches 212 to their other position. This switch position permits the pulse circuit to discharge the capacitor to deliver a damped sinusoidal shock to the electrodes.

('213 Patent at c. 5, ll: 47-59; '059 Patent at c. 5, ll: 43-55.) Yet, the specification also states that "[t]he test pulse may be a voltage pulse of any magnitude, including but not

[9] "Test signal" also appears in claims 1, 2, 6, 21, 22, 25, 41, 42, 51, 52, 61, 64, 65, 67, and 68 of the '374 Patent and Claim 7 of the '460 Patent. The Court construes "test signal" consistently throughout the '213, '374, and '460 Patents.

limited to voltage magnitudes used for actual defibrillation." ('213 Patent at c. 3, ll: 39-42.) The test pulses of the '213 and '059 Patents are not limited to a pulse that reaches the magnitude of a shock to a patient, as Cardiac Science suggests. The Court finds that "test pulse" is appropriately construed as "a pulse of any magnitude associated with testing."

The specification repeatedly refers to test signals. ('213 Patent at ll: 24-45.) Cardiac Science asserts that "test signal" is used only in reference to the ECG test. However, the claim language alone points to a broader construction. A comparison of the claims in which "test signal" appears makes clear that the "test signal" is not limited to an ECG signal. (*See* '213 Patent at cls. 8, 10, 24, 27.) The Court construes "test signal" as "a signal associated with testing."

The specification of the '059 Patent refers to many different types of "signals." The term is not limited to ECG signals, as Cardiac Science proposes. In fact, the specification describes "[a] signal substantially similar to an ECG signal," thus ruling out the "signal = ECG signal" construction that Cardiac Science proposes. ('059 Patent at c. 3, ll: 59-65.) The Court finds that the patent's usage of the term signal is consistent with the dictionary definition set forth by Philips, and the Court construes "signal" accordingly: "a detectable physical quantity or impulse (as a voltage, current, or magnetic field strength) by which messages or information can be transmitted."

C. The '212 Patent

The '212 Patent, entitled, "External Defibrillator Capable of Delivering Patient Impedance Compensated Biphasic Waveforms," was issued on April 4, 2000. ('212

Patent at 1.) The application for the '212 Patent is a continuation-in-part of the application that matured as U.S. Patent No. 5,735,879. (*Id*. at c. 1, ll: 5-8.) Generally, the '212 Patent describes a method and apparatus for using an AED to deliver a biphasic defibrillation shock to a patient. (*Id*. at c. 1, ll: 11-16.)

The claims at issue in the '212 Patent read as follows:

> 8. An external defibrillator comprising:
> an energy source;
> first and second electrodes adapted to make contact with a patient;
> a plurality of electronic switches;
> a controller controlling application of electrical energy from the energy source to the electrodes through the electronic switches in a truncated exponential multiphasic waveform.
> 9. The external defibrillator of claim 8 wherein the controller further comprises a timer.
> 10. The external defibrillator of claim 8 further comprising means for limiting voltage applied across one of the plurality of electronic switches.

(*Id*. at c. 8, ll: 30-44.)

1. "means for limiting voltage applied across one of the plurality of electronic switches"

Claim 10 of the '212 Patent describes an AED with "means for limiting voltage applied across one of the plurality of electronic switches." The parties agree that this is a means-plus-function clause, thereby subjecting it to 35 U.S.C. § 112, ¶ 6, and that the function is limiting voltage applied across one of the plurality of electronic switches. However, the parties dispute the structure necessary to perform that function. Cardiac Science asserts that the corresponding structure is "a fifth switch interposed between the second terminal of the energy source and the third and fourth switches." Philips asserts that the corresponding structure is either a controller circuit that terminates energy flow

from the energy source to the electrode only after the voltage has decayed below a desired level, or switch SW5 on Figure 11 of the patent. Thus, the parties' only dispute is whether the controller circuit, as proposed by Philips, is an alternative corresponding structure that performs this function.

Philips asserts that the patent describes the corresponding structure as the control circuit that terminates energy flow from energy source 32 to electrode 36, thus limiting voltage across the switches by activating the switches only after the shock waveform has decayed below a desired level. In support of its construction, Philips points to Figure 11 of the patent, asserting that the patent teaches that the controller ensures that switch SW5 does not need to withstand maximum capacitor voltage. (*See id*. at Fig. 11.)

The Court finds that Philips has stretched the boundaries of claim construction in this regard. The patent specification does not describe the "controller circuit" as performing the function of limiting voltage applied across one of the plurality of electronic switches. Rather, the specification teaches that the fifth switch limits the voltage when a voltage comparator determines that the voltage has reached a pre-determined level. (*Id*. at c. 7, ll: 3-31.) Thus, the Court finds that the structure that performs the function of limiting voltage is the fifth switch interposed between the second terminal of the energy source and the third and fourth switches.

2. truncated exponential biphasic [multiphasic] waveform

Claim 8 of the '212 Patent recites the delivery of electrical energy to a patient in a "truncated exponential multiphasic waveform."[10] Philips asserts that this phrase should be construed as "a defibrillation shock having at least two truncated exponential phases of opposite polarity." Cardiac Science contends that this term should be construed as "a waveform that is delivered in at least two phases, is interrupted prior to delivery of all energy, and ignoring change of phase and time between phases, has a continuous exponential shape." Thus, although the parties agree that each phase must be truncated and exponential in shape, the parties dispute whether the two phases must constitute one continuous exponential curve. In other words, the parties dispute whether if the second phase was flipped over, the second phase would start where the first phase ended (absent the interphase period), and continue with the same slope.

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[10] The term "truncated exponential biphasic waveform" appears in Claims 50 and 58 of the '454 Patent. That Patent, entitled "Electrotherapy Method and Apparatus," was issued on March 4, 1997. The claims at issue read as follows:

> 50. The method of claim 47 wherein the discharging step comprises the step of discharging the energy source across the electrodes to deliver electrical energy to the patient in a truncated exponential biphasic waveform.
>
> . . .
>
> 58. A method for applying electrotherapy to a patient through electrodes attached to an energy source the method comprising the following steps
>
> charging the energy source to an initial level prior to detecting a need to apply a shock to a patient,

(Footnote Continued on Next Page)

The Court finds that the truncated exponential multiphasic (or biphasic) waveform need not be continuous. First, both the '212 and '454 Patents depict the truncated multiphasic (biphasic) wave form represented in Figure 1 as a preferred embodiment of the waveform, not ruling out that other waveform configurations may fall within the scope of the invention. In fact, both the '212 and '454 Patents refer to implantable defibrillators that use truncated exponential biphasic waveforms. Of the examples cited, the inventors refer to U.S. Patent No. 4,800,883 (the "Winstrom Patent"). Undisputedly, the waveform of the Winstrom Patent is noncontinuous. (*See* Axtell Ex. 70 (Winstrom Patent) at sheet 8, Fig. 8c.) In addition, a preferred embodiment of the '454 Patent describes removing a resistor from the circuit during delivery of a shock. ('454 Patent at c. 6, ll: 52-56; c. 6, l: 67 – c. 7, l: 3.) Cardiac Science recognizes that a variation in either capacitance or resistance can change the shape of the curve. (Cardiac Science, Inc.'s Mem. of Law on Claim Construction for Additional Claim Terms from Philips' Patents at 17-18.) When a resistor is removed from the circuit, the resistance of the circuit will change, thus resulting in a noncontinuous waveform. Cardiac Science's proposed

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(Footnote Continued From Previous Page)

> determining the need to apply a shock to a patient,
> charging the energy source to a second level greater than the initial level
> discharging the energy source across the electrodes to deliver electrical energy to the patient in a truncated exponential biphasic waveform.

('454 Patent at c. 14, ll: 43-46; c. 16, ll: 1-12.) The '454 Patent is a continuation-in-part of the parent of the '212 Patent, and the '454 Patent provides no additional guidance with respect to the term at issue. Consistent with the parties' arguments, the Court will construe these claims consistently, the only difference being that the term "biphasic" applies to two phases, and the term "multiphasic" applies to at least two phases.

construction would read out a preferred embodiment, which is rarely proper without strong evidentiary support. *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1583 (Fed. Cir. 1996).

For these reasons, the Court construes the term "truncated biphasic (multiphasic) exponential waveform" as "a defibrillation shock having two (at least two) truncated exponential phases of opposite polarity."

D. The '054 Patent

The '054 Patent, entitled, "Apparatus for Controlling Delivery of Defibrillation Energy," was issued on May 8, 2001. ('054 Patent at 1.) Generally, the Patent describes a method for protecting the high energy delivery circuit of an AED in the event of a fault during delivery of a defibrillation shock. (*Id*. at c. 1, ll: 7-20.)

The claims at issue in the '054 Patent read as follows:

> 1. A circuit for producing a high energy pulse for application to a patient experiencing ventricular fibrillation, comprising
> a storage circuit operable to store electrical energy,
> a steering circuit coupled with the storage circuit, the steering circuit being adapted for coupling with the patient and operable to deliver the electrical energy from the storage circuit to the patient, and
> a protection circuit coupled with the storage circuit and with the steering circuit and operable to respond to a detected fault condition to selectively control the delivery of electrical energy from the storage circuit to the steering circuit.
> 2. A circuit according to claim 1 wherein the protection circuit includes a disarm circuit operable to selectively shunt delivery of the electrical energy away from the steering circuit[.]
> 3. A circuit according to claim 2 wherein the disarm circuit includes a switching element and a resistive element, the switching element selectively electrically connecting the storage circuit with the resistive element to dissipate the electrical energy therein[.]
> 4. A circuit according to claim 3 wherein the switching element is a silicon-controller rectifier[.]

. . .

12. A circuit for producing a high energy pulse for application to a patient experiencing ventricular fibrillation, comprising:

a storage circuit operable to store electrical energy,

a steering circuit coupled with the storage circuit, the steering circuit adapted for coupling with the patient and operable to deliver the electrical energy from the storage circuit to the patient, and

a disarm circuit coupled with the storage circuit and with the steering circuit, the disarm circuit operable to selectively shunt delivery of the electrical energy away from the steering circuit[.]

13. A circuit according to claim 12 wherein the disarm circuit includes a switching element and a resistive element, the switching element selectively electrically connecting the storage circuit with the resistive element to dissipate the electrical energy therein.

14. A circuit according to claim 13 wherein the switching element is a silicon-controlled rectifier.

. . .

20. A circuit for producing a high energy pulse for application to a patient experiencing ventricular fibrillation, comprising

a storage circuit operable to store electrical energy,

a steering circuit coupled with the storage circuit, the steering circuit being adapted for coupling with the patient and operable to deliver the electrical energy from the storage circuit to the patient,

a disarm circuit coupled with the storage circuit and with the steering circuit and operable to selectively shunt delivery of the electrical energy away from the steering circuit, and

a limit circuit coupling the storage circuit with the steering circuit and operable to limit delivery of the electrical energy from the storage circuit to the steering circuit, the disarm circuit and limit circuit together operable to substantially limit a maximum voltage applied across the steering circuit[.]

. . .

25. A circuit for producing a high energy pulse for application to a patient experiencing ventricular fibrillation, comprising:

a storage circuit having first and second terminals and operable to store electrical energy therebetween,

a steering circuit coupled with the first terminal of the storage circuit, the steering circuit adapted for coupling with the patient and operable to deliver the electrical energy from the storage circuit to the patient,

a disarm circuit coupled with the first and second terminals of the storage circuit, the disarm circuit operable to selectively shunt delivery of the electrical energy away from the steering circuit, and

a switching circuit coupled with the steering circuit and with the second terminal of the storage circuit, the switching circuit operable to electrically connect and disconnect the steering circuit to and from the second terminal of the storage circuit to initiate and interrupt the delivery of electrical energy through the steering circuit, all respectively[.]

. . .

40. In an electrical defibrillator having a storage circuit coupled with a steering circuit, the storage circuit for storing electrical energy and the steering circuit for directing the electrical energy to a patient, comprising the steps of

charging the storage circuit to store electrical energy therein,

forming a first electrical path from the storage circuit to the patient through the steering circuit,

initiating delivery of the electrical energy via the first electrical path,

sensing the rate at which the electrical energy is delivered via the first path, and

if the rate falls within a predetermined acceptable range, then continuing to deliver the electrical energy via the first electrical path, or

if the rate does not fall within the acceptable range, the method then further comprising the steps of,

forming a second electrical path from the storage circuit, and

opening the first electrical path.

41. A method according to claim 40 wherein the step of sensing the rate at which the electrical energy is delivered includes the step of sensing a current flow through the first electrical path[.]

42. A method according to claim 40 wherein the step of forming the second electrical path includes the step of forming an electrical path shunting the first electrical path[.]

43. A method according to claim 40 wherein if the rate does not fall within the acceptable range, the method further comprising the step of substantially dissipating the electrical energy in the second electrical path[.]

44. In an electrical defibrillator having a storage circuit coupled with a steering circuit, the storage circuit for storing electrical energy and the steering circuit for directing the electrical energy to a patient, a method of delivering electrical energy to a patient, comprising the steps of

charging the storage circuit to store electrical energy therein,

forming a first electrical path from the storage circuit to the patient through the steering circuit,

initiating delivery of the electrical energy via the first electrical path,

limiting the delivery of the electrical energy,

sensing the rate at which the electrical energy is delivered via the first path, or

if the rate falls within a predetermined acceptable range, then continuing to deliver the electrical energy via the first electrical path, or

if the rate does not fall within the acceptable range, the method then further comprising the steps of,

forming a second electrical path from the storage circuit, and

opening the first electrical path[.]

45. A method according to claim 44 wherein the step of limiting the delivery of the electrical energy includes the step of limiting electrical current.

46. A method according to claim 44 wherein the step of limiting the delivery of the electrical energy includes the step of limiting the time rate of change of electrical current[.]

. . .

48. A method according to claim 44 wherein the step of forming the second electrical path includes the step of forming an electrical path shunting the first electrical path[.]

49. A method according to claim 44 wherein if the rate does not fall within the acceptable range, the method further comprising the step of substantially dissipating the electrical energy in the second electrical path[.]

50. In an electrical defibrillator having a storage circuit coupled with a steering circuit, the storage circuit for storing electrical energy and the steering circuit for directing the electrical energy to a patient, a method of delivering electrical energy to a patient, comprising the steps of

storing electrical energy in the storage circuit,

initiating electrical current flow through the steering circuit, and

measuring a current magnitude of the electrical current flow through the steering circuit, and

> if the current magnitude falls within a predetermined acceptable range then continuing to allow the electrical current flow through the steering circuit, or
> if the current magnitude does not fall within the acceptable range, the method then further comprising the steps of,
> forming an electrical path shunting the steering circuit,
> controlling voltage applied across the steering circuit and
> stopping the electrical current flow through the steering circuit[.]
>
> 51. A method according to claim 50 wherein the step of controlling voltage applied across the steering circuit includes the step of limiting a maximum voltage applied across the steering circuit[.]
>
> 52. A method according to claim 50 wherein the step of controlling voltage applied across the steering circuit includes the step of limiting the time rate of change of the voltage applied across the steering circuit[.]
>
> 53. A method according to claim 50 wherein if the current magnitude does not fall within the acceptable range, the method further comprising the step of substantially dissipating remaining electrical energy stored in the storage circuit[.]

('054 Patent at c. 10, ll: 17-40; c. 11, ll: 34-52; c. 12, ll: 29-47; c. 13, ll: 31-51; c. 15, ll: 4-63; c. 16, ll: 1-42.)

1. "limit circuit"

Claim 20 of the '054 Patent describes "a limit circuit." Cardiac Science asserts that this term should be construed as "a circuit, disposed between the storage circuit and the steering circuit, to limit delivery of therapeutic electrical energy from the storage circuit to the steering circuit." Philips, on the other hand, proposes that "limit circuit" should be construed as "a circuit, disposed between the storage circuit and the steering circuit, that enables the protection circuit to limit delivery of the therapeutic electrical energy from the storage circuit to the steering circuit." Thus, the only dispute is whether the limit circuit enables the protection circuit, as Philips contends.

The Court disagrees with Philips' construction. Claim 20, the only asserted claim that uses the term "limit circuit," does not include a protection circuit. Figure 3 depicts one embodiment of the limit circuit as separate from the protection circuit. ('054 Patent at sheet 3, Fig. 3; c. 6, ll: 20-22, 29-47.) The Court finds that "limit circuit" is properly construed as "a circuit, disposed between the storage circuit and the steering circuit, to limit delivery of therapeutic electrical energy from the storage circuit to the steering circuit."

2. "protection circuit"

Claim 1 of the '054 Patent refers to a "protection circuit." Philips asserts that this term should be construed as "a circuit for protecting the steering circuit from a fault condition by selectively controlling the delivery of therapeutic electrical energy from the storage circuit to the steering circuit." Cardiac Science contends that a "protection circuit" is "a circuit that limits energy delivery from the storage circuit to the steering circuit and discharges or otherwise disarms the storage circuit in the event of a fault condition."

The specification describes the preferred embodiment as follows:

> The protection circuit 48 (shown in FIG. 3) functions to limit energy delivery from the ESC 42 to the steering circuit 46 (and hence to the patient) and to discharge or otherwise disarm the ESC 42 in the event of a fault condition.

('054 Patent at c. 5, ll: 6-9.) Yet, the specification also states, more broadly, that "[t]he protection circuit may include a limit circuit that limits the rate of delivery of the electrical energy from the storage circuit to the steering circuit." (*Id*. at c. 2, ll: 60-62.)

Dependent Claims 2 and 9 also appear to offer alternate embodiments: Claim 2 including a disarm circuit and Claim 9 including a disarm circuit and a limit circuit. The doctrine of claim differentiation would provide that Claim 1, the claim from which Claims 2 and 9 depend, is broader and encompasses both of the constructions of Claims 2 and 9 — a disarm circuit alone, or a disarm circuit plus a limit circuit. Based on this language from the specification, the Court finds that both ways of protecting — the disarm circuit and the limit circuit — are not required elements of the protection circuit. Philips' proposed construction encompasses this notion. (*Id*. at c. 2, ll: 55-57 ("The protection circuit selectively controls the delivery of the electrical energy from the storage circuit to the steering circuit[.]").) For these reasons, the Court construes "protection circuit" as "a circuit for protecting the steering circuit from a fault condition by selectively controlling the delivery of therapeutic electrical energy from the storage circuit to the steering circuit."

3. "steering circuit"

The '054 Patent also describes a "steering circuit." Cardiac Science asserts that this term be construed as "a circuit containing multiple switching elements that can produce at least two different paths for delivery of electrical energy from a single storage circuit to thereby create a multiphasic or biphasic waveform." Philips, on the other hand, proposes that "steering circuit" be construed as "a circuit for directing the therapeutic electrical energy from a storage circuit to the patient through at least two different paths." Thus, both parties agree that the steering circuit "steers" electrical energy along two

different paths. However, the parties dispute whether the paths originate at a single energy source, as Cardiac Science contends.

The preferred embodiment of the '054 Patent teaches a steering circuit directing electrical energy along two different paths, with those paths originating at a single capacitor (or energy source). However, the term "steering circuit" is not limited to that preferred embodiment. ('054 Patent at sheet 3, Fig. 3; c. 10, ll: 1-15.) Nothing else in the patent restricts the steering circuit to one specific circuit configuration. Thus, the Court construes the term "steering circuit" as a "circuit for directing the therapeutic electrical energy from a storage circuit to the patient through at least two different paths."

G. The '961 Patent

The '961 Patent, entitled "Dynamic Load Controller for a Battery," was issued on June 30, 1998. ('961 Patent at 1.) Generally, the patent relates to battery load controllers and battery capacity monitors for battery-operated electrotherapy devices. (*Id*. at c. 1, ll: 6-10.) The '961 Patent addresses problems with the ineffective battery capacity warnings of prior art[11] by teaching a battery load controller or capacity monitor that provides a low battery warning early enough that the device may generally continue to be operated through a full course of treatment before the battery is replaced. (*Id*. at c. 2, l: 62 – c. 4, l: 5.)

The term requiring construction appears in the following disputed claims:

[11] Because of changes in ambient temperature and other factors, prior art defibrillators failed to give low battery warnings until the battery was nearly dead. A battery would have to be replaced mid-rescue, thus compromising the possibility of a successful rescue.

> 69. The method of claim 67 wherein the providing step comprises providing a low battery indication based on the value of the battery parameter, the providing step being performed while the electrotherapy device can provide at least six electrical shocks to the patient before the battery is depleted.
>
> 70. The method of claim 67 wherein the providing step comprises providing a low battery indication based on the value of the battery parameter, the providing step being performed while the electrotherapy device can provide at least nine electrical shocks to the patient before the battery is depleted.
>
> . . .
>
> 81. The apparatus of claim 80 the indication circuitry for providing a low battery capacity indication based on a value of the battery parameter while the electrotherapy device can provide at least six therapeutic electrical shocks to a patient before the battery is depleted.
>
> 82. The apparatus of claim 80, the indication circuitry for providing the low battery capacity indication based on a value of the battery parameter while the electrotherapy device can provide at least nine therapeutic electrical shocks to a patient before the battery is depleted.

(*Id*. at c. 17, ll: 7-18; c. 18, ll: 13-22.)

1. "the electrotherapy device can provide at least six [nine] electrical [therapeutic electrical] shocks to the [a] patient before the battery is depleted"

Claims 69, 70, 81, and 82, the only claims asserted in the '961 Patent, state that "the electrotherapy device can provide at least six [nine] electrical [therapeutical electrical] shocks to the [a] patient before the battery is depleted." The parties dispute the meaning of this term. Philips asserts that the term should be construed as "a defibrillator battery has enough charge to delivery to a patient, six [nine] defibrillation shocks across the normal operating temperature range." Cardiac Science proposes that the term be defined as "when the battery low warning is given, the battery is able to deliver at least six [nine] therapeutic electrical shocks to the patient." Thus, the dispute centers on

whether the six [or nine] shocks remaining must be provided "across the normal operating temperature range" of the defibrillator.

Neither the claim language nor the specification supports a construction that includes the phrase "across the normal operating temperature range" of the defibrillator. Philips' attempts to rely upon extrinsic evidence to support its construction are unavailing. The Court construes "the electrotherapy device can provide at least six [nine] electrical [therapeutical electrical] shocks to the [a] patient before the battery is depleted" as "when the battery low warning is given, the battery is able to deliver at least six [nine] therapeutic electrical shocks to the patient."

Conclusion

As a final matter, Philips has moved to strike a brief and additional substantive arguments filed by Cardiac Science on March 31, 2006, which purportedly served to identify inconsistencies in Philips' prior briefing and positions taken at the *Markman* hearing. In the interest of fairness, and because Cardiac Science's new arguments merely serve to create yet another moving target of proposed claim constructions, Philips' motion is granted.

Therefore, **IT IS HEREBY ORDERED** that:

1. The claims at issue are construed as set forth in this Order.

2. Philips' Motion to Strike (Doc. No. 414) is **GRANTED**.

Dated: April 20, 2006

s/Donovan W. Frank
DONOVAN W. FRANK
Judge of United States District Court